BUREAU OF HYGIENE AND TROPICAL DISEASES.

TROPICAL DISEASES BULLETIN.

Vol. 30.] 1933. [No. 9.

RABIES.

A REVIEW OF RECENT ARTICLES. XIX.*

i. *Virus.*

In a fully illustrated paper LEVADITI, SCHOEN & MEZGER[1] collect the researches already summarized (this *Bulletin,* Vol. 30, p. 134), from communications to the *Bull. Acad. Med.* and the *C. R. Soc. Biol.* They hold the opinion that the " parasite of rabies " should be called *Glugea Lyssae,* and not as has been proposed by MANOUELIAN & VIALA, *Encephalitozoon rabiei.* The morphological appearances in no way resemble those of *Encephalitozoon cuniculi.* The spores of the latter have a uniform appearance, and their volume in rabbits and mice is invariable. Their structure is perfectly definite and so also are the cysts or pansporoblasts which enclose them. The oxyphil corpuscles described by LEVADITI and his co-workers in rabies infections of mice, though they resemble in certain stages those described by MANOUELIAN & VIALA in the rabbit and the dog, are in reality pansporoblasts consisting of an infinity of sporules of dimensions which are almost ultra-microscopic. The sporules do not possess definite characters at all comparable with the spores of *Encephalitozoon cuniculi.*

A further study of the cystic stage of " Glugea Lyssae " in the white mouse has been made by LEVADITI & MEZGER,[2] using dark ground illumination with a magnification of about 1,800 diameters. The cysts measure from 5 to 20 micromillimetres. They are covered by a refractile membrane, and are round or ovoid. These sacs contain the young cysts whose number is proportional to the size of the envelope. The young cysts are also covered by a refractile membrane, they enclose a dark substance, and are separated from each other by granular material.

That the " noyau optique basal " of NICOLAU & KOPCIOWSKA and what THOMAS & JACKSON call the " nucleus oculomotorius " is a seat of election for Negri bodies has been already referred to (Vol. 28,

* For the eighteenth of this series see Vol. 30, pp. 133–143.

[1] LEVADITI (C.), SCHOEN (R.) & MEZGER (J. G.). Etude morphologique du virus rabique.—*Arch. Internat. Méd. Experim.* 1932. Dec. Vol. 7. No. 4. pp. 655–692. With 21 figs. & 1 coloured plate. [Refs. in footnotes.]

[2] LEVADITI (C.) & MEZGER (J. G.). Structure polykystique du parasite de la rage.—*C. R. Soc. Biol.* 1933. Feb. 10. Vol. 112. No. 5. pp. 440–442. With 1 fig.

p. 744 and Vol. 29, p. 600). [There is no doubt in the reviewer's mind that the seat of election described by the latter authors in October 1930 is the same as that described by the French authors in May 1932.] The French authors, it will be remembered, found Negri bodies in this region in fixed virus rabies of rabbits. They[3] confirm this observation in the case of two strains of fixed virus, one a virus of *Chien fou* isolated by MATHIS & CONSTANTINESCO (Vol. 29, p. 597), and the other a highly virulent strain of fixed virus isolated by JONNESCO in Rumania (Vol. 30, p. 136). In the case of the Mathis strain the inclusions are much more numerous and of larger dimensions in the seat of election than in the horn of Ammon. In the case of the Rumanian strain they are so small and rare as to be practically non-existent in the horn of Ammon, whereas in the elective zone they are numerous, of large dimensions, and show the characteristic internal structure.

A full account of the occurrence of rabies in the Union of South Africa is given by NEITZ & MARAIS.[4] The summary by DUTOIT quoted in this *Bulletin*, Vol. 28, pp. 742–743, brought the history up to 1928. It now appears that since that date the existence of rabies has been proved in thirty instances, and presumed on clinical evidence in six other instances. Of these, eight have occurred in the human subject. As before genets and meerkats appear to be the most usual source of infection. Photographs of these animals are given, and also maps showing the distribution of the disease. The probable origin of the infection is discussed, and methods of control, adopted and proposed, are considered.

It will be remembered that VAUCEL, BOISSEAU & SALEUN proved by cross immunity experiments that a strain of street virus from Brazzaville (French Equatorial Africa) was identical with the rabies virus of Europe. VAUCEL & SALEUN[5] have now studied three other strains of virus from the same vicinity. In each case they have experienced no difficulty in passaging the strain through many generations, and in two, crossed immunity experiments have shown that the viruses were identical with rabies. "In spite of the diversity and indefiniteness of the symptoms observed in the animal, the three strains which have been studied have behaved, from the histological point of view, like those of true rabies."

An exceptionally virulent strain of street virus is described by PALAWANDOW & SEREBRENNAJA.[6] It was obtained at the Odessa Institute from the saliva of a twelve-year-old girl, bitten by a dog on the leg. She had received no treatment and developed rabies

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[3] NICOLAU (S.) & KOPCIOWSKA (L.). Rage du lapin, à virus fixe, et corps de Negri ; dénombrement comparatif des inclusions dans la corne d'Ammon et dans la zone élective (noyau optique basal).—*C. R. Soc. Biol.* 1933. Feb. 10. Vol. 112. No. 5. pp. 445–448. With 2 figs.

[4] NEITZ (W. O.) & MARAIS (I. P.). Rabies as it occurs in the Union of South Africa.—*Union of South Africa. 18th Report, Director Vet. Services & Animal Industry, Onderstepoort, Pretoria. 1932. Aug.* pp. 71–98. With 5 figs. & 6 maps. [32 refs.]

[5] VAUCEL (M.) & SALEUN (G.). Rage canine en Afrique Equatoriale Française. —*Bull. Soc. Path. Exot.* 1932. Dec. 14. Vol. 25. No. 10. pp. 1018–1021.

[6] PALAWANDOW (Haidar) & SEREBRENNAJA (A. I.). Ueber einig Eigentümlichkeiten der im Odessaer Bakteriologischen Institute isolierten Strassenvira.—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1933. Vol. 78. No. 3/4. pp. 230–238. [12 refs.]

after an incubation period of two months. The first passage of saliva intramuscularly into a guineapig gave an incubation period of 12 days. In eleven subdural subpassages in guineapigs the incubation varied from 1 to 4 days and averaged about 2½ days. The minimal lethal dose was 0·2 cc. of a 1 in 75,000 dilution. The virus is now in its 40th passage. After the eleventh passage a feature of extraordinary interest was noticed—that the incubation periods gradually lengthened. From the 10th to the 29th passages the incubation for guineapigs was 3–3½ days, and for rabbits 3–4 days. After the 29th the incubation period for guineapigs was 4–6 days, and for rabbits 5–7 days ; in fact the virus had become fixed virus. [It is impossible to reconcile these facts with the view which is usually held that fixed virus is a virus which has become accommodated to the easier mode of transmission from brain to brain, whereas street virus is accustomed to a much more complicated transmission from saliva to nerve-endings and central nervous system and *vice versa* at each passage. The authors assume that in the case of the Sokolan strain (described above) the virus comes to equilibrium as a fixed virus, after the elimination of some *accelerating* influence.]

The strain of fixed virus employed at Budapest has been examined by AUJESZKY & KERBLER.[7] This virus was taken from a dog by Högyes in 1886 and is now in (approximately) its 17,000th passage. The dose which will kill with certainty when injected subdurally is 0·15 cc. of a dilution of 1 in 6,000, that is to say 0·025 milligrammes of brain substance. The incubation period has shortened—paralysis on the 5th day—and the period of illness has also diminished.

In a previous communication (this *Bulletin*, Vol. 29, p. 189), SHOPE drew attention to the close resemblance between the virus of the " mad itch " of cattle in America, and the pseudo-rabies of AUJESZKY. He has now[8] carried out cross immunity experiments between a " mad itch " virus obtained from a cow in Iowa, and a pseudorabies virus furnished by Aujeszky from Budapest. The various mixtures of serum and virus were stored in the refrigerator over night. The results were as follows :—

Virus	Serum	No. of Guineapigs	No. Died
Pseudorabies	Normal	5	5
,,	Pseudorabies convalescent	6	0
,,	Mad itch convalescent	4	0
Mad itch	Normal	5	5
,,	Pseudorabies convalescent	6	0
,,	Mad itch convalescent	4	0

1 cc. of a 10 per cent. suspension of virus was mixed with 0·5 cc. serum from a pig ; 1·5 cc. of the mixture was inoculated subcutaneously. " In recognition of the identity . . . . the mad itch virus will in future be designated as Pseudorabies Virus (Iowa strain)."

[7] AUJESZKY (A.) & KERBLER (F.). Ueber Veränderungen der biologischen Eigenschaften des Virus fixe.—*Giorn. di Batteriol. e Immunol.* 1933. Feb. Vol. 10. No. 2. pp. 257–266. [10 refs.] English summary.

[8] SHOPE (Richard E.). Identity of the Viruses causing " Mad Itch " and Pseudorabies.—*Proc. Soc. Experim. Biol. & Med.* 1932. Dec. Vol. 30. No. 3. pp. 308–309.

In a second communication[9] SHOPE continues his study of this strain. The virus was passaged separately through the brains of 9 guineapigs and 12 rabbits. From titration experiments it appeared that following fatal cerebral infection the virus is ten times more prevalent in rabbit brain than in guineapig brain, and that the guineapig is about 100 times more resistant to subcutaneous dosage than is the rabbit. "Over and above the working of these two factors, guineapig passage appears to achieve some actual attenuation of virus when tested by subcutaneous inoculation into guineapigs."

According to REMLINGER & BAILLY[10] the virus of the pseudo-rabies of AUJESZKY when injected into the tissues of a receptive animal does not suffer any "eclipse" (this *Bulletin*, Vol. 27, p. 252). It multiplies *in situ* until it passes into the blood and from thence into the central nervous system. Here it multiplies abundantly and may be used for subpassage. The points to be noticed are that the Aujeszky virus travels to the central nervous system by way of the blood and lymphatics, and not along the nerves. In certain cases an infected animal may die before the virus has reached the centres. The duration of the illness is so short (a few hours) that the phenomenon of autosterilization does not occur. Nothing is known regarding the localization of the virus in the brain. After the central nervous system has become infective, the virus may pass centrifugally along the peripheral nerves, but death often occurs before this takes place. It will be seen from the above that two stages occur: a blood phase during which the animal may die, and then a nerve phase. It is not surprising that various organs are found to be more infective than is the case in rabies. The disease has been reproduced from inoculations of liver pulp, of spleen, kidney, testicle, suprarenals, bone marrow, etc. "Special mention ought to be made of the presence of the virus in the lung, as was found by Shope in 'mad-itch' which appears to be a form of the disease of Aujeszky." Saliva, bile, urine, and faeces on the other hand failed to infect rabbits and guineapigs. Transmission by biting has always been unsuccessful.

A further study of the virus of *mal de caderas* has been made by COSTA.[11] It will be remembered (this *Bulletin*, Vol. 29, p. 189) that REMLINGER & BAILLY, from extended experiments with a virus supplied by ROSENBUSCH, concluded that it was a rabies virus. COSTA comes to the same conclusion, but adds that it is a strain of rabies virus with peculiar modifications. Its clinical manifestations in herbivora are not the same as those of rabies virus, and transmission to man appears to be very unusual. A sero-vaccine prepared, after the manner of FERMI, from a strain of *mal de caderas* virus which had been fixed by subpassage, afforded adequate protection against the disease, but a similar vaccine prepared directly from a cow which was killed in the paralytic phase of *mal de caderas* was ineffective. The fixed virus vaccine consisted of 3 parts of a 30 per cent. brain

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[9] SHOPE (Richard E.). Modification of the Pathogenicity of Pseudorabies Virus by Animal Passage.—*Jl. Experim. Med.* 1933. June 1. Vol. 57. No. 6. pp. 925–931.

[10] REMLINGER (P.) & BAILLY (J.). Le siège du virus dans la maladie d'Aujeszky expérimentale.—*C. R. Soc. Biol.* 1933. Vol. 113. No. 18. pp. 125–126.

[11] COSTA (M. Humberto). Contribución al estudio del mal de caderas de los bovinos. II. Estudio experimental del virus y la vacuna.—*Rev. Higiene y San. Pecuarias.* 1933. Jan.–Feb. Vol. 23. No. 1–2. pp. 5–24. [16 refs.]

emulsion added to 1 part of immune serum. It is stated that since prophylactic treatment with this vaccine "the epizootic has totally disappeared."

ZIBORDI[12] has failed on three occasions to transmit fixed virus through the pulp of the canine tooth of the dog. The injections were made through an opening which had previously been made with a trephine. A similar experiment on two dogs with street virus also failed. Rabies did not develop in any of the animals inoculated by this route. That the viruses were potent was proved by control experiments using various routes.

ii. *Symptomatology.*

A case of rabies with an incubation period of 14 months is described by HAJARE.[13]

The clinical features of two cases of rabies are reported from Philadelphia, U.S.A., by REISMAN, FOX, ALPERS & COOPER.[14] In one of the cases an autopsy was performed, and the microscopic appearances in the brain and cord are described in detail. Neither case presented any unusual features.

iii. *Diagnosis.*

SEREBRENNAJA & PUGATSCH[15] recount their experiences in the diagnosis of rabies. During six years they have examined 1,096 brains of suspected animals. Of the three methods of staining employed, those of Stutzer, Muromzew and Turewitsch, they have found the last to be the most exact. The composition of this stain is given as haematoxylin, acid fuchsin and picric acid, without further details. From their results they conclude that Negri bodies are living growing bodies with a definite life cycle.

iv. *Pathology.*

It will be remembered that MARIE[16] obtained contradictory results when rabies virus was inoculated intramuscularly, intravenously or subcutaneously, after the reticulo-endothelial system had been blocked with Indian ink. He has now repeated these experiments with the difference that the infecting dose was introduced into the peritoneal cavity. The experimental details will be published later; the conclusions are stated to be as follows: (1) That even large doses of fixed virus do not infect when introduced into the peritoneal cavity is well known. (2) If, however, Indian ink emulsion is previously injected, infection occurs in guineapigs with an incubation period of from 9–20 days. In two sets of six animals, only one of the first set and two

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[12] ZIBORDI (D.). Studi sperimentali sulla trasmissione della rabbia.—*Giorn. di Batteriol. e Immunol.* 1932. Dec. Vol. 9. No. 6. pp. 929–940. [20 refs.]

[13] HAJARE (S. S.). A Case of Rabies with an Unusually Long Incubation Period. —*Indian Med. Gaz.* 1933. Apr. Vol. 68. No. 4. p. 212.

[14] RIESMAN (David), FOX (W. W.), ALPERS (B. J.) & COOPER (David A.). Hydrophobia. Report of Two Fatal Cases with Pathologic Studies in One.—*Arch. Intern. Med.* 1933. May. Vol. 51. No. 5. pp. 643–655. With 8 figs.

[15] SEREBRENNAJA (A.) & PUGATSCH (E.). Ueber die Rolle der Negrikörper bei der Diagnosestellung und Aetiologie der Tollwut.—*Zent. f. Bakt.* I. Abt. Orig. 1933. Feb. 23. Vol. 127. No. 7/8. pp. 417–426.

[16] MARIE (A. C.). De l'infection rabique par la voie péritonèale.—*C. R. Soc. Biol.* 1932. Dec. 16. Vol. 111. No. 39. pp. 869–870.

of the second failed to contract the disease. (3) A suspension of "Deinse" (2 cc. phosphate disodique 5 per cent., with 0·5 cc. chloride of calcium 5 per cent.) gave a similar result. (4) Guineapigs which survived after intraperitoneal injection of fixed virus (without previous treatment by Indian ink) were found to be not immune to intra-ocular inoculation.

HAVENS & MAYFIELD[17] continue their study of the antigenic properties of rabies virus (Vol. 29, p. 601). In the earlier communication it was found that fixed virus immune serum failed to cause flocculation of 1 out of 16 strains of street virus. The authors have now found three other strains which were not agglutinable. The antigenic composition of these inagglutinable strains are investigated in the present communication, using fixed virus as a basis for comparison. Nine strains (including the 4 non-agglutinable strains and one of fixed virus) and nine homologous immune sera, were set up against each other. The fixed virus was agglutinated by all the sera in approximately the similar degree, suggesting that all the strains possessed a common factor. "That they possessed additional factors in their antigenic composition was shown by the failure of all but one to agglutinate to the titre of the fixed virus." No two of the strains appeared to be identical. Cross absorption tests were then carried out. That the absorption was specific was indicated by the fact that normal brain suspensions had no absorptive power. Marked dissimilarities between particular strains were observed, but again there was evidence of the existence of some common factor. Viricidal tests were then carried out and these again disclosed the existence of "apparently fundamental differences between the strains. They also indicated, however, that it is the common factor that is most essential in the production of immunity." The differences observed seem to be due to the presence or absence in whole or in part, of additional antigenic factors.

GREVAL[18, 19] describes in detail a method based upon the Wassermann technique, for estimating the degree of complement fixation. He proposes to use this method both for comparisons of sera, and for comparisons of antirabic vaccines as antigens. From experiments, which are not given in detail, it appeared that the antigenic capacity of vaccines improved with keeping, and that rabbit brain vaccines were less potent as antigens than sheep brain antigens. He uses for complement fixation as antigen, a filtrate of a three months old 5 per cent. carbolized Paris (virus) sheep (brain) vaccine prepared as follows: The brain of a sheep is made into an 8 per cent. emulsion with 1 per cent. carbolic acid in normal saline; this is incubated for 24 hours at 37°C., and then diluted to a 5 per cent. suspension with normal saline. This is kept at room temperature for about 30 days before use.

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[17] HAVENS (Leon C.) & MAYFIELD (Catherine R.). Antigenic Properties of the Virus of Rabies. II. Multiplicity of Strains as shown by Agglutinin Absorption and Neutralization.—*Jl. Infect. Dis.* 1932. Nov.–Dec. Vol. 51. No. 3. pp. 511–518.

[18] GREVAL (S. D. S.). On Rabies. Complement Fixation in Rabies; the Technique, its Purpose and Associated Considerations.—*Indian Jl. Med. Res.* 1933. Jan. Vol. 20. No. 3. pp. 913–920. [13 refs.]

[19] GREVAL (S. D. S.). The Rôle of Serology in Rabies.—*Indian Med. Gaz.* 1932. Dec. Vol. 67. No. 12. pp. 676–678. [13 refs.]

A case of transmission of fixed virus infection from mother to young is reported by SCHNEIDER & MCGROARTY.[20] A sheep was inoculated subdurally with 0·2 cc. fixed virus. Two days later it gave birth to a lamb. The sheep died of rabies on the sixth day after inoculation having nursed the lamb for four days. Twelve days after birth the lamb showed definite symptoms of rabies. The brain of the lamb was injected subdurally into two rabbits; both rabbits died of rabies in seven days.

v. *Methods of Treatment and Statistics.*

The investigation on the relative immunizing potencies of etherized and carbolized vaccines undertaken by CUNNINGHAM and his co-workers in accordance with the resolution of the International Rabies Conference (Paris 1927) has been frequently referred to in these reviews. (Vol. 24, p. 229; Vol. 25, p. 190; Vol. 26, p. 219; Vol. 27, p. 742.) It will be remembered that the results both of treatment of human beings and of experiments on rabbits and monkeys were best in the case of those treated by Alivisatos' method, less good when Hempt's vaccine was used, and poorest with carbolized vaccines. In those experiments, however, there was great variation in the dosage of nerve substance, the quantities being (for human beings) 6 to 8, 4, and 0·7 gm. respectively. It was realized that until the three methods were contrasted in uniform dosage no definite conclusion as to relative efficiency could be drawn. The present communication[21] by CUNNINGHAM, MALONE & CRAIGHEAD deals with certain aspects of this problem. Carbolized vaccines were given to 4,474 persons, and ether carbolized vaccines to 4,513 according to the alternate case system, and as a check 1,598 persons of the type of Hempt's Class III, were treated by Alivisatos' method. In each case the vaccine was a 5 per cent. emulsion of brain substance. The figures are given in detail, and the results have been examined for significant differences by MCKENDRICK (Appendix B). The general conclusion is arrived at that 5 per cent. carbolized and 5 per cent. Alivisatos' vaccines are similar and both superior to 5 per cent. etherized-carbolized vaccine. A large experiment was conducted upon animals. With regard to the method of preparation of the vaccine it appears that 5 per cent. Alivisatos' vaccine is superior to 5 per cent. etherized-carbolized vaccine and to no treatment, and that 5 per cent. carbolized vaccine takes a mid position between Alivisatos' vaccine and etherized-carbolized vaccine, though it is not significantly different from either. As regards strain of virus, Paris fixed virus is superior to Kasauli fixed virus. [These are in brief the general conclusions of an investigation which is an example of thoroughness and of patient labour. That the comparison of methods of treatment is a laborious business will be recognized by all who read this exhaustive memoir

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[20] SCHNEIDER (J. E.) & MCGROARTY (B. J.). Transmission of Experimental Rabies from Mother to Young.—*Jl. Amer. Vet. Med. Assoc.* 1933. Apr. Vol. 82. N.S. Vol. 35. No. 4. p. 627.

[21] CUNNINGHAM (J.), MALONE (R. H.) & CRAIGHEAD (A. C.). An Investigation into the Value of an Etherized Vaccine in the Prophylactic Treatment of Rabies. Part VIII. The Comparative Immunizing Value of Carbolized, Etherized-Carbolized and Etherized Vaccines Tested under Identical Conditions of Dosage and Administration.—*Indian Med. Res. Memoirs. Supplementary Series to Indian Jl. Med. Res.* 1933. Jan. Memoir No. 26. pp. vii + 144. With 1 chart.

of 144 pages. It should be studied not only by those interested in rabies, but by those who are concerned with treatment by vaccines of any sort.]

The vaccines of Fermi and Philipps are compared by PALAWANDOW & SEREBRENNAJA (Odessa).[22] Because of the weak bactericidal power of glycerine, and its thick consistence, the preparation of Philipps' vaccine involves a loss of about 30 per cent. of material. Fermi's vaccine requires no dilutions once it is prepared, whereas Philipps' vaccine has to be diluted daily. The vaccine of Fermi is always sterile, whereas about 10 per cent. of Philipps' vaccine has to be discarded on account of bacterial contamination. The immunizing power of Fermi's vaccine is the higher, as also is the rabicidal power produced in the blood. The advantages which are possessed by Fermi's vaccine are probably due to the larger quantity of nerve substance which it contains, and also to the action of the phenol.

A third analytical review by MCKENDRICK[23] of statistics from Pasteur Institutes on the results of antirabic treatment undertaken by the Health Section of the League of Nations at the instance of the International Rabies Conference (Paris 1927) has appeared. It deals with the data relating to 69,541 treated persons, and relates mainly to the year 1930.

The figures under review again emphasize the fact that the non-European is at a much higher degree of risk than the European. The mortalities for the two race groups are in the ratio of 7·8 to 1.

No evidence has been found which suggests the existence of a superiority of any one method of treatment over any other, or, more generally, there is no evidence of the existence of a superiority of treatment by live vaccines over treatment by killed vaccines. With regard to this point the reader is referred to the following table which comprises such figures as it was possible to extract from the three reviews relating

Treatment	Number treated	Deaths		Mortality per cent.
		Observed	Calculated*	
Cords	1,784	5	3·4	0·28
Dilutions	4,731	7	9·1	0·15
Killed phenol	2,920	4	5·6	0·14
Live phenol	526	2	1·0	0·38
Heated	6,685	16	12·9	0·24
Ether killed	5,098	8	9·8	0·16
Mixed	5,338	10	10·3	0·19
Ether not killed ...	1,978	4	3·8	0·20
	29,060	56		0·19

* From the average mortality.

[22] PALAWANDOW (Haidar) & SEREBRENNAJA (A. I.). Vergleichende experimentelle Untersuchungen ueber die Methoden von Fermi und Philipps.—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1933. Vol. 78. No. 3/4. pp. 217–230. [13 refs.]

[23] MCKENDRICK (A. G.). A Third Analytical Review of Reports from Pasteur Institutes on the Results of Anti-Rabies Treatment.—*Quart. Bull. Health Organisation, League of Nations.* Geneva. 1932. Dec. Vol. 1. No. 4. pp. 725–755.

to persons of a single race type (European) who were bitten by animals which were certified to be rabid (Categories A and B).

The probability that equal or greater differences than those observed would be likely to occur in a population which was admittedly homogeneous is found to be 0·8 so that there is no evidence of heterogeneity in the statistics gathered over the whole period. If the mixed group and those treated by ether (not killed) vaccines be combined, as seems reasonable since in both groups the treatment of severe cases is by the method of Alivisatos, the figures are as follows: number treated 7,316; observed deaths 14; calculated deaths 14·1; mortality per cent. 0·19.

From the figures submitted it would appear that liability to accident varies significantly according to the method of treatment employed. The relative incidence from the figures collected since the inception of these reviews is given in Section XII. It appears that the liability to accident from live vaccines is greater than the liability from killed, and that the liability from killed vaccines is greater than the liability from heated.

The table referred to deals with the combined statistics covered by the three reviews and is as follows :—

Treatment	Number treated	Accidents	Proportion	Percentage
Cords	33,751	17	1 in 1,985	0·051
Dilutions	14,649	4	1 in 3,662	0·030
Killed phenol ...	59,911	5	1 in 11,982	0·0085
Live phenol	1,117	0	—	<0·09
Heated	22,716	0	—	<0·004
Ether killed	22,038	3	1 in 7,346	0·014
Mixed	13,088	4	1 in 3,272	0·031
Ether not killed ...	3,634	0	—	<0·028
	170,904	33	1 in 5,179	0·019

If the last two groups be combined the figures are serially 16,722; 4; 1 in 4,180, and 0·024 per cent.

In the annual report of the Pasteur Institute at Kasauli (India), SHORTT[24] reports that as a result of the series of experiments carried out by Cunningham and his co-workers, the vaccine now employed is, as before, that of Semple, but that the dosage has been largely increased in the case of the severely bitten. The dosage for the slightly bitten is 1,400 mgm. during 7 days, whilst for the severely bitten it has been increased to a maximum of 8,500 mgm. in 15 days. The figures are still experimental in the sense that Paris and Kasauli strains of fixed virus are compared, as are also vaccine from the sheep and from the rabbit. The combined results are as follows :—

[24] KASAULI, PASTEUR INSTITUTE OF INDIA: The Thirty-First Annual Report of the Director of the Institute for 1931. Part II (Scientific) [SHORTT (H. E.), Director].—46 pp. Delhi: Govt. Printers.

	Cases	Deaths	Mortality per cent.
Europeans treated at Institute ...	314	0	0
Non-Europeans treated at Institute	7,389	95	1·29
Europeans treated outside	801	0	0
Non-Europeans treated outside ...	2,643	8	0·30

One rather doubtful case of post-vaccinial paralysis is reported. The percentage of health returns received after six months from the termination of treatment for those treated at the Institute is above 72 per cent., and for those treated at out-centres it is above 63 per cent.

At Coonoor[25] the dosage of carbolized vaccine has also been increased ; in this case the variation is between 700 and 3,500 mgm. administered during 14 days. The results published by IYENGAR, are as follows :—

	Cases	Deaths	Mortality per cent.
Europeans at Institute	40	0	0
Non-Europeans at Institute	462	7	1·51
Europeans outside	236	2	0·75
Non-Europeans outside	7,790	58	0·74

No cases of post-vaccinial paralysis have occurred. The percentage of health returns received six months after the expiration of treatment is above 94 per cent.

The method of Semple is employed at the " Instituto Vital Brasil." The number treated is 544, and no deaths from rabies nor cases of post-vaccinial paralysis have been observed. BRASIL & LEAL[26] discuss the treatment of rabies generally.

VIALA[27] reports that during the year 1932, 561 persons were treated at the Pasteur Institute, Paris, and that none of these developed rabies. No post-vaccinial paralyses were observed.

vi. *Rabies in Animals.*

From experiments on 45 frogs (*Rana temporaria*) BATTAGLINO[28] confirms the observation of REMLINGER & BAILLY that the frog is refractory to rabic infection. The frogs were killed at intervals and their brains tested for virulence. In frogs which were in a state of lethargy, virulence was retained for a period of about 32 days, whereas when the frogs were active virulence was lost after about 3 days. The

[25] COONOOR, PASTEUR INSTITUTE OF SOUTHERN INDIA : Twenty-Fifth Report of the Director of the Institute for 1931 [IYENGAR (K. R. K.), Director].—69 pp. Madras : Madras Publishing House.

[26] BRASIL (Vital), Jr. & LEAL (A. Estillac). Vaccinaçaõ anti-rabica pelo methodo de Semple.—*Brasil-Medico.* 1932. Nov. 5. Vol. 46. No. 45. pp. 931–933.

[27] VIALA (Jules). Les vaccinations antirabiques à l'Institut Pasteur en 1932.—*Ann. Inst. Pasteur.* 1933. May. Vol. 50. No. 5. pp. 745–748.

[28] BATTAGLINO (Giuseppe). Contributo allo studio del virus rabido nella rana.—*Giorn. di Batteriol. e Immunol.* 1932. Dec. Vol. 9. No. 6. pp. 961–971. English summary (5 lines).

tests for virulence were carried out on guineapigs, which were more susceptible than rabbits. The virus recovered from the frog's brain had not become attenuated.

Five more cases of rabies in the mongoose are reported by GREVAL[29] from India.

The statistics of post-infectional antirabic treatment of domestic animals in Hungary during the last thirty years are analysed by AUJESZKY.[30] In all 19,979 domestic animals have received treatment. The method employed is a modification of the dilution method of Högyes (eight inoculations during 6 to 9 days). Information regarding the fate of the animal was available in 19,583 cases. Of these 347 died during the course of treatment or during the succeeding 14 days; of the remaining 19,236, 130 developed rabies (0·67 per cent.). Three cases of paralytic accident, none of which were fatal, were observed. Data are also given of the incubation periods observed in the different animals.

Statistics of preventive inoculation of animals furnished by BALOZET[31] from Tunis, show that of 482 dogs vaccinated prophylactically during the period 1st October 1931 to 31st December 1932, three developed rabies. These three had been bitten by a rabid dog a month or two before vaccination, and so cannot be considered as failures of prophylactic inoculation. The effect of the prophylactic measures is demonstrated by the following figures from the town of Bizerta. In 1931, 22 cases of rabies occurred. In the first quarter of 1932, 20 cases were reported. In the second quarter, that is 9 to 15 months after the administration of the vaccine, only one case of rabies was observed.

An "antirabic week" has been instituted in Japan[32] for the control of rabies in districts where the disease is present. During this period

Year	No. of rabid dogs	No. of dogs inoculated	No. of persons bitten	No. of deaths from rabies
1921	—	—	—	54
1922	—	—	—	79
1923	2,644	116,050	—	174
1924	3,205	194,177	—	235
1925	3,036	255,097	—	143
1926	1,799	234,680	—	80
1927	986	200,032	1,446	30
1928	434	225,636	1,122	22
1929	172	145,653	5*6	12
1930	65	128,753	267	4
1931	44	—	65	—
1932	63	—	—	—

* The figure between the 5 and 6 is illegible.

[29] GREVAL (S. D. S.). Rabies in the Mongoose. Further Observations.—*Indian Med. Gaz.* 1933. Jan. Vol. 68. No. 1. pp. 20–23.

[30] AUJESZKY (A.). Dreissig Jahre der postinfektionellen Wutschutzimpfung der Haustiere in Ungarn.—*Deut. Tierärzt. Woch.* 1933. Apr. 8. Vol. 41. No. 14. pp. 209–210.

[31] BALOZET (L.) La vaccination antirabique des animaux en Tunisie du 1er octobre 1931 au 31 décembre 1932.—*Arch. Inst. Pasteur de Tunis.* 1933. Apr. Vol. 21. No. 3. pp. 538–543.

[32] JOURNAL OF THE PUBLIC HEALTH ASSOCIATION OF JAPAN. 1933. Apr. Vol. 9. No. 4. pp. 2–3.—Measures taken in Japan for the Prevention of Rabies.

all dogs are registered, unclaimed dogs are destroyed, preventive inoculation is given, etc. The results appear in the table (p. 585).

vii. *Post-Vaccinial Paralyses.*

Three cases of post-vaccinial paralysis amongst persons treated by Semple's carbolized vaccine are described by STUART and KRIKORIAN.[33] They occurred within the period April 28th to July 29th 1932, and two had a fatal termination. The occurrence of such accidents at Jerusalem has been as follows :—The first occurred after 4,580 bitten persons had been treated, the second after 5,409, and the fifth after 9,950. Again, "while the period 1923–7 was entirely free from accident, the period 1928–32 showed 5 cases of post-treatment paralyses." Of the five, three showed Landry's syndrome and ended fatally; the other two were cases of dorso-myelitis and have recovered. "A parallel is found in the statistics of the Vienna Institute: whereas between 1894 and 1914, 7,632 bitten persons were treated without accident, between 1915 and 1923, 6,764 treatments yielded 39 cases (5·7 per thousand)." These periodic increases cannot be ascribed to intensification of treatment or be explained by the numbers of passages to which the fixed virus used has been submitted (Bujwid's theory). They lend support to the view that the incidence shows periodic increases. The histopathological appearances were those of varying degrees of degenerative change in the nerve cells, with considerable perivascular congestion. Perivascular demyelination and "cuffing" were absent. No Negri bodies were found. "A cytotoxin, rather than a virus theory of origin, is again advanced. Thus in the basic nerve substance of all antirabic vaccines there seems to exist some deleterious component which, though adversely affected by various physical and chemical agencies, is still capable, in peculiarly susceptible individuals, of producing neuroparalytic disorders."

viii. *Miscellaneous.*

From an experiment carried out on 12 guineapigs, three treated with fixed virus brain, three with normal brain, and three controls, DOLFINI[34] comes to the conclusion that antirabic treatment (method of Puntoni) has no influence on the occurrence of characteristics of anaphylactic shock induced by horse serum. As antirabic vaccine is rich in lipoids, this result is considered to be of importance in relation to the view held by many, that anaphylactic shock is inhibited by the parenteral injection of lipoids.

In the second part of a memoir entitled "Studies in Rabies," REMLINGER & BAILLY[35] have collected a number of recent papers. In the first and second sections they describe the treatment of dogs and other animals by etherized virus, and give the results of their experience in Morocco. (This *Bulletin*, Vol. 30, p. 137 and earlier papers.) In the second they describe their experiments with the Trinidad virus

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[33] STUART (G.) & KRIKORIAN (K. S.). Neuroparalytic Accidents Complicating Antirabic Treatment.—*Brit. Med. Jl.* 1933. Mar. 25. pp. 501–504. [21 refs.]

[34] DOLFINI (G.). Può la vaccinazione antirabica modificare uno stato di sensibilizzazione allergica?—*Policlinico.* Sez. Prat. 1933. Feb. 20. Vol. 40. No. 8. pp. 285–287. [20 refs.]

[35] REMLINGER (P.) & BAILLY (J.). Etudes sur la rage (deuxième mémoire).—*Ann. Inst. Pasteur.* 1932. Dec. Vol. 49. No. 6. pp. 665–735. [Refs. in footnotes.]

(Vol. 29, p. 596). The third section deals with the effects of alcoholism during immunization (Vol. 30, p. 143). The fourth on phylaxis deals with the action of sparteine (Vol. 30, p. 140). The fifth on the persistence of rabies virus in the brain of the tortoise has already been reviewed (Vol. 29, p. 605 and Vol. 30, p. 141). The sixth is on the influence of cachexia on the pathogenesis of rabies (Vol. 29, p. 607). The seventh discusses the influence of anaesthesia on the incubation period of rabies (Vol. 29, p. 607). The eighth and last is on the passage of rabies virus through the milk (Vol. 30, p. 137). The results of these researches are thus already in the hands of the reader.

A. G. McKendrick.

TROPICAL DERMATOLOGY.

BRINDLEY (Paul) & HOWELL (W. L.). **Madura Foot in the United States.**—*Southern Med. Jl.* 1932. Oct. Vol. 25. No. 10. pp. 1022–1026. With 8 figs.

By 1921, 13 cases of mycetoma had been reported in the United States; since then 12 more have been described. To this list the author now adds three seen in Texas, two having occurred in Mexican women and one in a negro. After detailed notes of these three typical cases, the epidemiology of the whole 28 is studied. Six were seen in whites, 7 in negroes and 15 in Mexicans. Twenty-three were males, 19 were labourers and 16 gave a history of previous trauma. Nineteen occurred in the southern States, *i.e.*, in a semitropical climate. Six specimens in all have been examined by the authors, their clinical and histological appearances being described. *M. Sydney Thomson.*

TRAUT (Heinrich). Ueber Jodbehandlung bei Madurafuss. [**Treatment of Madura Foot by Iodine.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1933. Mar. Vol. 37. No. 3. pp. 147–148.

A boy of 14 at Canton, China, after treading on a thorn developed a swollen foot with fistulae and discharge of yellow granules. The greater part of the phalanges and metatarsals came away. He was treated with a solution of 1 gm. Iod., 2 gm. K.I. with water to 300 cc. beginning with 0·5 cc. and rising by the same amount every 4–5 days to 5·0 cc. intravenously. He made a good recovery and was seen 1½ years later walking without a stick. The only drawback was the obliteration of veins after 3–4 injections. No bacteriological details.

A. G. B.

MONSERRAT (Carlos). **Pseudomycetoma in the Philippines, with Report of One Case.**—*Philippine Jl. Sci.* 1932. Nov. Vol. 49. No. 3. pp. 469–481. With 4 plates (1 coloured). [11 refs.]

The case occurred in a male Filipino, aged 28 years, who when first seen gave a history of nine years' duration. For the first five years a small elongated mass was present below the left external malleolus; this was freely movable on the underlying tissues and was not painful. Following a local wound four years ago, the mass rapidly enlarged and suppurated. Central healing was then followed by the appearance of small nodules in the neighbourhood, each of which ruptured in turn. This process gradually spread peripherally until, at the time of examination, most of the left foot was swollen and covered with multiple nodules, some hard and some exuding a thin discharge. Patches of scarring and hyperkeratosis were also present. The whole lower half of the leg was enlarged and the upper half atrophied. No granules were seen in the pus, but its inoculation on blood hormone agar resulted in the growth of a streptothrix. The morphological and biological characteristics of the organism are described in detail and appear to resemble those exhibited by *Streptothrix freeri*. *M. S. T.*

KITTREDGE (H. E.) **Trichophytosis, including Onychomycosis Universalis, simulating Tinea Imbricata. Report of an Unusually Extensive Case.**—*Arch. Dermat. & Syph.* 1933. Apr. Vol. 27. No. 4. pp. 607–623. With 6 figs. [68 refs.]

Describes in great detail a very chronic and very extensive case of ringworm, the patient being a white man, a native of Florida. Practically the whole of the body and all twenty nails were affected, the causative organism being *T. purpureum.* It is suggested that tinea imbricata is not an entity, but may be caused by different fungi, particularly in those cases where the ringlike configuration is entirely lost. " In a temperate climate like that of North America, an extensive trichophytic eruption of tropical origin may constitute a clinical analogue of the tinea imbricata of the tropics." *M. S. T.*

CATANEI (A.). Description de *Trichophyton gourvili* n. sp., agent d'une teigne de l'homme. [**Description of** *Trichophyton gourvili* **n. sp., found in a Case of Human Ringworm.**]—*Bull. Soc. Path. Exot.* 1933. Mar. 8. Vol. 26. No. 3. pp. 377–381. With 1 plate.

During a study of ringworm of the scalp among children of Bamako (French West Africa), two examples of a new fungus were isolated. It is an endothrix and has been given the above name in honour of Dr. GOURVIL, one of the author's colleagues. The cultural and morphological characteristics, etc., are described in detail. *M. S. T.*

CONNOR (J. Ivan). **Favus in Mice and Men.**—*Med. Jl. Australia.* 1932. Dec. 24. 19th Year. Vol. 2. No. 26. pp. 765–767. With 4 figs.

Describes an outbreak in the wheat-growing areas of Victoria and New South Wales. Infected mice were obtained from the wheat stacks near Melbourne and proved to be carriers of *Achorion quinckeanum.* The same fungus was grown from infected patients, who, however, comprised only a small proportion of the total number of men exposed. In these cases scutula were rare, erythematous rings being present on the glabrous skin and kerion-like lesions on the scalp.

M. S. T.

CHAVARRÍA (Peña) & ROTTER (Werner). Die kolumbianische Piedra. [**Piedra in Colombia.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1933. Feb. Vol. 37. No. 2. pp. 73–87. With 16 figs. [17 refs.]

An investigation based on twelve cases, from every one of which there was isolated not only *Trichosporon giganteum* but also *T. Hortai.* Experimental efforts to inoculate the disease into mice, rats, dogs, guineapigs and apes were all unsuccessful. Nevertheless the authors believe that *T. Hortai* is really the responsible agent because *T. giganteum* is widespread and is found in cases of pityriasis in countries where piedra is unknown and also because cultures of *T. Hortai* correspond in colour and shape with the appearances presented by the hair nodes.

The cultural characteristics of the fungus are discussed and it is claimed that six specimens obtained from Brazilian and Paraguayan cases presented the same features. *M. S. T.*

PUNTONI (V.) & PAMPANA (E. J.). *Trichophyton megnini, seu rosaceum,* in un caso di caraté bruno-rameico della Colombia. [*Trichophyton megnini* **seu** *rosaceum* **isolated from a Case of Pinta.**]—*Ann. d'Igiene.* 1932. June. Vol. 42. No. 6. pp. 378–384. [15 refs.]

The patient, a Colombian negro, of 22 years, showed a condition of pinta, which started at the fold of the left elbow 11 years ago and now was present on both arms and on the trunk, back and front. He had had yaws at the age of 13 years. The Kahn reaction gave ++++. Treatment by salicylic acid ointment and by injections of neosalvarsan was ineffectual.

The main interest lies in the isolation on Sabouraud's medium of a fungus giving at first a velvety white growth whose surface later acquired a red tint. This was subcultured and identified as *T. megnini* Blanchard 1895 (*T. rosaceum* Sabouraud 1909). Other fragments produced sparse colonies of *Aspergillus cinerescens,* "a transition form between *A. fumigatus* and *A. glaucus.*" The Trichophyton greatly preponderated and the authors regard it as the cause of pinta in Colombia. *H. H. S.*

CATANEI (A.). Recherches sur les trichophyties cutanées obtenues chez le cobaye après introduction dans l'organisme de cultures de *Trichophyton.* [**Ringworm in the Guineapig after Inoculation with a Trichophyton.**]—*Arch. Inst. Pasteur d'Algérie.* 1932. June. Vol. 10. No. 2. pp. 195–203.

During these experiments cultures of *T. radiolatum* were used, whilst selection of the animals, sterilization of the cages, etc., were carefully controlled throughout. The cultures were introduced either by the mouth, or by subcutaneous, intraperitoneal or intravenous injection; after which a small area on the back was scarified. Three series of experiments were carried out with each type of inoculation. Subcutaneous and intraperitoneal injections gave only 2 positive results in 22 experiments. Oral ingestion and intravenous injection always resulted in the rapid appearance of infection at the site of scarification. Local contamination by infected faeces is probably the most important factor governing the positive results in the first group.

M. S. T.

WILSON (Sidney J.), HULSEY (Sim) & WEIDMAN (Fred D.). **Chromoblastomycosis in Texas.**—*Arch. Dermat. & Syph.* 1933. Jan. Vol. 27. No. 1. pp. 107–120. With 5 figs. [10 refs.]

Describes a case of extensive verrucous disease of one leg, of forty years duration and due to *Phialophora verrucosa.*

It occurred in a white male, resident all his life in Texas. Clinically it was typical. Histologically it resembled Gilchrist's blastomycosis except that the organisms are deep brown in colour and show no budding.

The causative fungus was isolated and injected into rats. These experiments proved its low virulence, for whilst it always caused granulomata at the sites of injection, the lesions always remained localized. This corresponds to the clinical aspects in that the internal organs always seem to escape infection in chromoblastomycosis, whereas metastases

are common in Gilchrist's disease. It is also suggested that Kaposi's sarcoma might be regarded as a mycid with an internal primary focus, this possibility being based on the findings in a necropsy, to which, however, only passing reference is made. *M. S. T.*

ROTTER (Werner) & CHAVARRÍA (Peña). Untersuchungen ueber Blastomykosen in Costa Rica. [**Investigations of Blastomycosis in Costa Rica.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1933. Jan. Vol. 37. No. 1. pp. 1–10. With 14 figs.

Describes in detail a case of chromoblastomycosis, which corresponds exactly to that reported in the same area by NAUCK in 1931 [this *Bulletin*, Vol. 29, p. 276]. This is followed by a description of four other cases of the type known in South America as Espundia. The histological pictures presented by these diseases and by "mossy foot," are discussed from the point of view of their differential diagnosis. Both the clinical and the microscopical photographs are excellent.

M. S. T.

BONNE (C.). **A Few Remarks on Two Rare Parasitic Diseases in the Malayan Archipelago. A. Chromoblastomycosis. B. Sparganosis.**—Reprinted from *Far Eastern Assoc. Trop. Med. Trans. Eighth Congress, Bangkok, 1930. Dec.* pp. 184–187. With 4 figs. on 2 plates.

Chromoblastomycosis. Describes a case seen in Batavia in 1927, the disease having started on the dorsum of the left foot seven years before. Both clinical and histological pictures were typical of chromoblastomycosis, whilst inoculation on Sabouraud-agar yielded an abundant growth of a fungus with yellowish spores. The Malayan native had acquired the infection in Sumatra, and reference is made to a second case from that area, described by KWANEGEN and ELTE in 1930. *M. S. T.*

i. BONNE (C.). Over een tweeden vorm van huidblastomycose in den Indischen Archipel. [**A Second Form of Blastomycosis of the Skin in the Indian Archipelago.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1931. Dec. 15. Vol. 71. No. 18. pp. 1502–1509. [1 ref.] English summary.

ii. ——. Over het begrip Blastomycose.—*Ibid.* pp. 1509–1512. With 5 figs. on 2 plates. English summary.

i. "Besides chromoblastomycosis, previously described by the author from Java and Sumatra [see this *Bulletin*, Vol. 26, p. 762; Vol. 28, 405], a second form of blastomycosis of the skin, resembling the Gilchrist type is here reported. It does not seem to be rare at all, but its histological diagnosis is difficult on account of the scarcity of the organisms and their indifferent staining reactions.

"The disease attacks various parts of the body: back, legs, buttocks; it is characterised by acanthosis, dermal infiltration with round cells and eosinophils and the formation of miliary or larger abscesses and fistulae. Blastomycetes are present in the pus, usually in scanty numbers. Budding and dividing forms can be observed. Sometimes they occur in small groups of three or four. Their usual size is 4–10 μ, seldom larger. Probably very small intracellular forms of 1–2 μ or smaller also exist. They stain with haematoxylin the same way as the nuclei of cells and only in favourable positions they can with certainty be recognized from pycnotic

nuclei of tissue cells or leucocytes. The center of the parasite usually remains unstained but the perifery presents itself as a more or less darkly stained crescent or rim.

ii. " The term blastomycosis can only have a definite meaning when we understand it as a pathological condition caused by the blastomycetes. But in many forms of blastomycosis one does not succeed in reproducing the disease in animals by inoculations of the cultures obtained. On the other hand saprophytic yeasts are extremely common on skin and mucous membranes. And so little is known about the systematic position of the various parasitic and saprophytic blastomycetes that it is often rather dangerous to found a diagnosis of blastomycosis only on a positive culture or pus-preparation. A histological study of the tissues gives more certainty, when a definite tissue reaction is visible. But one should always keep in mind the possibility, that the invasion by blastomycetes and the tissue reaction caused by their presence may be secondary processes in already diseased organs. However, as long as there are no indications of the existence of another primary disease, the simplest way is to consider the blastomycetes as the primary aetiological agents. In leprosy, *e.g.*, we meet similar unsatisfactory experimental results, but still we accept the bacilli as the cause of leprosy.

" The term ' blastomycetes ' is used in medicine in a very general way, quite different from the interpretation of this word in botany. In the future it will be gradually replaced by more accurate systematic botanic names." *A. G. B.*

VASUDEVAN (A.). **An Unusual Type of Parasitic Infection of Forearm.** —*Indian Jl. Med. Res.* 1932. July. Vol. 20. No. 1. pp. 299–302. With 6 figs. on 1 plate.

The findings in a portion of tissue from a lesion in the forearm received from Ceylon ; no history was obtained. A parasite is described resembling in some respects *Rhinosporidium seeberi* but considered to be a protozoon. It is illustrated in six figures. *A. G. B.*

HURI. Sur une forme de pyodermite : Pyodermite extensive à Staphylocoque. Son traitement par la méthode de Besredka. [**A Type of Pyogenic Dermatitis due to Staphylococcal Infection.**]—*Bull. Soc. Path. Exot.* 1933. Apr. 5. Vol. 26. No. 4. pp. 573–576.

An account of cases seen in Syria only during the hot season. Itching of the exposed parts of the body is rapidly followed by the appearance of tiny pustules, which quickly become confluent. Cultures taken from these lesions grow large numbers of *St. aureus*. After about a week the pustules become covered by fragile scabs which break to allow the escape of blood and pus. Five to eight days later these crusts fall off and a fresh crop of pustules appears. These relapses gradually result in more and more involvement of the skin. There is never any systemic disturbance, although the disease persists throughout the whole of the season. All treatments failed to effect a cure until Besredka's local antivirus method was used. *M. S. T.*

HASSARD (E. N.). **" Prickly Heat," by a Sufferer.** [Correspondence.] —*Jl. Trop. Med. & Hyg.* 1932. Sept. 15. Vol. 35. No. 18. p. 288.

The writer's directions are as follows :—Take a piece of old linen or rag, wet it with perchloride of mercury solution 1/1,000 direct from the

bottle's mouth, dab the prickly heat with the wet linen and let the solution dry off without wiping. This should be repeated several times a day and will effect a cure. In the case of a baby the perchloride should be diluted with half of water. [It would be risky to use such a solution over a large area of skin.] *A. G. B.*

CORKILL (N. L.) & SCANDER (Daoud). **A Condition Superficially resembling Mossy Foot, in a Native of the Sudan.**—*Ann. Trop. Med. & Parasit.* 1932. Oct. 29. Vol. 26. No. 3. pp. 267–272. With 2 figs. on 1 plate.

A male Nuba, aged about 40, presented a lesion of the left foot which had started thirty years earlier as an ulcer on the anterior surface of the leg, immediately above the ankle joint. This apparently healed at times but frequently relapsed until fifteen years ago when it was noticed that the lower edge had become thickened and tough. Since then persistent spread has led to a deep indolent ulcer covering the lower third of the leg and the upper half of the dorsum of the foot, with exposure of the tibia. The remainder of the foot was grossly enlarged and bore bosses of various sizes. The skin was papillomatous except for the areas where the sole touched the ground. General examination revealed clubbing of the fingers and some splenic enlargement. Amputation was performed and microscopy showed a granulomatous condition with a very excessive deposit of fibrous tissue. No organism of any kind was discovered by staining methods, whilst cultures grew only a few colonies of *Staphylococcus aureus*. Whilst the general appearances were those of mycetoma, yet no sinuses, no granules, no involvement of bones or tendons and no oedema of the tissues were present. *M. S. T.*

FLEMING (A. McK.) & HENNESSEY (R. S. F.). **A Dermatosis occurring among East African Natives.**—*Brit. Jl. Dermat. & Syph.* 1932. Apr. Vol. 44. No. 4. pp. 173–181. With 7 figs.

A description of six cases seen in Uganda within a period of twelve months. All occurred in natives, the past histories therefore being unreliable; yet an average duration of two years before treatment would seem to be established. Examination revealed a patchy, coarse thickening of the skin, each plaque showing superimposed papules with some excoriation and secondary infection. The distribution is usually most pronounced on those parts of the body exposed to irritation and friction. Each patch "felt like a piece of soft but fairly thick leather." The papules were smooth, rounded, deep and varied from 1 to 5 mm. in diameter. Small, hard glands were palpable in a few areas only. Physical examinations were otherwise negative, but all cases had an eosinophilia of 20 to 50 per cent. The lesions themselves consisted of a fibrosis extending deeply into the corium, with areas of lymphocytic and eosinophilic infiltration. An axillary gland also showed a similar infiltration. All other pathological investigations proved negative. Treatment has so far relieved the irritation only. *M. S. T.*

BLOOM (David) & NEWMAN (Ben). Ainhum: Report of a Case with Roentgenologic Findings and Review of Literature.—*Arch. Dermat. & Syph.* 1933. May. Vol. 27. No. 5. pp. 783–793. With 3 figs. [31 refs.]

CROVERI (Paolo) & BORSOTTI (P. C.). Su di un caso di micosi della guancia da *Penicillium crustaceum.*—*Arch. Ital. Sci. Med. Colon.* 1932. Nov. 1. Vol. 13. No. 11. pp. 665–676. With 5 figs. English summary (4 lines).

FITZGERALD (G. H.). A Mycetoma-like Condition of the Foot.—*Indian Med. Gaz.* 1932. Sept. Vol. 67. No. 9. pp. 517–518. With 1 fig.

FRÓES (Heitor P.). Ueber die Ätiologie der Dermatitis linearis serpiginosa (Hautmaulwurf) in Brasilien.—*Dermat. Woch.* 1933. May 13. Vol. 96. No. 19. pp. 662–663.

STEIN (Robert Otto). Ueber die Behandlung von Narben und Keloiden.—*Mitt. d. Volksgsndhtsamt.* Vienna. 1933. Jan. 1. No. 1. pp. 12–14.

YAWS AND SYPHILIS.

SCOTT (C. Justin). **Yaws.**—*Proc. Transvaal Mine Med. Officers' Assoc.* 1933. Feb. Vol. 12. No. 139. Special Supplement pp. 41–70. With 35 figs. [51 refs.]

After giving a general account of yaws gleaned from the writings of others, Dr. Scott deals with an outbreak of the disease among natives employed in one of the Rand mines near Johannesburg.

In January 1931 the author in conjunction with Dr. DANIEL found that yaws was prevalent among the natives working in the Turf mine. On enquiry it was discovered that occasional cases of yaws had been diagnosed by the M.O. in charge during the years 1915–1925. Between 1925 and 1931 with a change in the M.O. these cases were diagnosed and treated as syphilis. In 1930, 78 cases had been so diagnosed. In 1931 the incidence was as follows:—Jan. 11; Feb. 18; Mar. 16; Apr. 26; May 22; June 23; July 23; Aug. 25; Sept. 33; Oct. 57; Nov. 48; Dec. 36.

An attempt to discover the factors leading to the outbreak was unsuccessful. Yaws appeared to have been present among the Turf shaft natives for at least 15 years but had not spread to neighbouring mines; then in 1931 this outbreak occurred, still without spread to other mines. Though the various groups of natives lived together in their compounds no case occurred among 1,000 "surface" natives, and only 2 per thousand among 4,000 working down the Chris shaft, while 84 per thousand of the "boys" working in the Turf shaft were affected. This fact seemed to point to infection taking place in the Turf shaft, a conclusion further supported by finding that 7 white miners of this shaft had contracted yaws in the previous eighteen months. Two or three points are worthy of note. The primary lesion occurred on every part of the body except the foot and ankle—a fact explained by the fact that the boys wear boots. Whereas Johannesburg is about 6,000 feet altitude and the temperature in the native compounds below zero at night in the winter months, the workings are 1,000–2,000 feet below sea level with a temperature from 87°F. wet and 88°F. dry bulb to 91°F. wet and 92°F. dry. The results of treatment—various combinations of neosalvarsan and bismuth—are dealt with very fully and do not lend themselves to being summarized. It was considered that 4 intravenous injections of 0·45 Neo combined with the same number of intramuscular injections of 3 grains Bis. sod. tart. at 3 days' interval gave the best results. Of 61 cases 6 passed out of observation 2–3 months after treatment, all had negative W.R. and no recurrence; 23 had had no recurrence in 3 to 9 months' observation, 32 no recurrence after 9 months' observation. With other methods a recurrence rate of from 17 to 70 per cent. was seen.

[It would have been interesting to have observations upon the differential diagnosis with syphilis and also to have heard whether lesions on mucous membranes did or did not occur.]

H. S. Stannus.

D'SOUZA (A. J.). **Yaws in the Nicobar Islands.**—*Indian Med. Gaz.* 1933. Mar. Vol. 68. No. 3. pp. 155–159.

It had been reported in the past that syphilis was very prevalent in the Nicobars. A recent investigation, however, has shown that very

few cases of syphilis occur and these have acquired their infection at trading centres in touch with the outer world. On the other hand yaws was discovered to be not uncommon, chiefly among young adults, and presented the usual picture of the disease, including the occurrence of gangosa and juxta-articular nodules. *H. S. S.*

MATTLET (G.). Note au sujet de l'hérédité du pian. [**Heredity in Yaws.**]—*Ann. Soc. Belge de Méd. Trop.* 1933. Mar. 31. Vol. 13. No. 1. pp. 13–15.

The W.R. Hecht and Meinicke tests on the blood of a 10-day-old infant, the child of a mother presenting a florid yaws eruption and herself W.R. Hecht and Meinicke positive, were all negative. The author had waited a number of years to get this opportunity. His opinion is that the placenta bars the passage of *T. pertenue* and maternal antibodies to the foetus.

He finds that in Ruanda-Urundi, where yaws is extremely widespread, it plays no part in causing a low birth rate or in causing abortions or a high infant mortality. *H. S. S.*

MONTEL (R.) & COUPUT (A.). Lésions ostéo-périostiques tertiaires dans le pian. Aspect radiologique. [**Tertiary Lesions of Bone in Yaws. Radiology.**]—*Bull. Soc. Path. Exot.* 1932. Dec. 14. Vol. 25. No. 10. pp. 1032–1036. With 14 figs. on 4 plates. [11 refs.]

The authors deal with the bony lesions met with in yaws as seen in patients at the Municipal Polyclinic of Saigon, Cochinchina.

The changes are of the nature of a rarefying osteitis, osteo-periostitis with hyperostitis and gumma formations. The evolution of the processses is slow and accompanied by osteocopic pain. Fistula-formation, extensive ulceration with elephantoid changes, arthritis and ankylosis commonly follow. The bones most commonly attacked are those of the limbs but the clavicle, ribs, vertebrae and in fact any bone may be involved. Some 10–20 per cent. of their yaws cases showed bone lesions ; they occurred chiefly in children and adolescents and the incidence is greatest among the ill-fed. Among observations extending over 30 years and many thousands of cases no case of goundou was seen and only one case of gangosa—a fact for which no explanation is forthcoming.

The authors believe that the proliferation of the periosteum and thickening of the external zone of the bone characteristic of syphilis is not seen in framboesial lesions, whereas the lesions which are so extensive, so widespread, and so generalized in yaws are never so diffuse in syphilis. *H. S. S.*

GARCIA (Onofre). **Serologic Study of Cerebrospinal Fluids in Philippine Monkeys inoculated with Yaws, Syphilis, or Both.**—*Philippine Jl. Sci.* 1933. Feb. Vol. 50. No. 2. pp. 199–203.

Sera and cerebrospinal fluids from 35 monkeys which had been infected with yaws or syphilis or both by SCHÖBL seven months to four years previously were examined, there being at the time no manifestations of disease.

The Wassermann and Kahn tests were uniformly negative in the C.S.F. but late positive serologic response was found in the blood serum of most of the animals. *H. S. S.*

MONTEL (R.). Nodosités juxta-articulaires. (A propos d'une communication de MM. Fontoynont, G. Girard et H. Woltz sur une nouvelle conception des "nodosités juxta-articulaires" des Malgaches.) [**Juxta-Articular Nodules.**]—*Bull. Soc. Path. Exot.* 1933. Mar. 8. Vol. 26. No. 3. pp. 458–460. With 2 figs.

Attention is drawn to the confusion which is likely to arise if the term J.A.N. be applied to conditions other than that defined by JEANSELME under that name.

The author criticizes on this account the article by FONTOYNONT, GIRARD and WOLTZ [see this *Bulletin*, Vol. 28, p. 935] in which they described generalized subcutaneous nodules containing uric acid and cholesterin and obviously of the nature of tophi in natives of Madagascar. He also points out that the consideration together of J.A.N. and rheumatic nodes by Mathieu-Pierre WEILL and DELARUE (3rd Internat. Congress on Rheumatism) and by CROUZON and GAUCHER (*Monde Méd.* 1932. Nov. 12) is unwarranted. *H. S. S.*

BLACKLOCK (D. B.). **Relationship of Syphilis and Yaws.**—*Brit. Med. Jl.* 1933. Jan. 21. pp. 97–98.

This article covers much the same ground as one by the same author already noticed in this *Bulletin* [*ante*, p. 185]. *H. S. S.*

CLIMATIC BUBO AND LYMPHOGRANULOMA INGUINALE.

STANNUS (H. S.). **The History of the Recognition of a New Venereal Disease, comprising Climatic Bubo, Lymphogranuloma Inguinale, Esthiomène, Chronic Elephantiasis and Ulceration of the Vulva, the Genito-Ano-Rectal Syndrome, Inflammatory Stricture of the Rectum.**—*Proc. Roy. Soc. Med.* 1932. Nov. Vol. 26. No. 1. pp. 7–15 (Sect. of Trop. Dis. & Parasit. pp. 1–9).

Most tropical practitioners must be familiar with climatic bubo but few perhaps have had access to the literature dealing with an identical condition occurring in Europe, the United States and other temperate countries commonly referred to as lymphogranuloma inguinale, after DURAND, NICOLAS & FAVRE, who described the affection in Lyons in 1913. In his presidential address, Section of Tropical Diseases and Parasitology, Royal Society of Medicine, the author dealt with the history of these two conditions from the earlier records down to the time of their recognition as a single clinical entity with similar antigenic skin reactions, and to the present time when the proof of their identity has been established by the recovery from both of an ultra-microscopic virus with identical reactions in experimental animals. Some account, brief perforce, was given of the symptomatology and pathology, the method of performing the intra-cuti-reaction of Frei, etc. The results of later researches were then alluded to, which go to show that a number of rather rare conditions—chronic elephantiasis and ulceration of the vulva, esthiomène, "lupus vulvae," and what has been called inflammatory stricture of the rectum (a condition largely restricted to the female sex) are all due to an infection with the same virus.

The conditions are to be found not only in Europe and America but also among native races of Africa and the East, though rarely

recorded. In the past many diseases such as syphilis, gonorrhoea, chancroid and tuberculosis have been put forward as etiological factors in these conditions but without any satisfactory evidence to that effect. Many more observations among native races are wanted to fill up the gaps in our knowledge of this venereal disease, which should have for the clinician a fresh interest in view of the light thrown upon its nature by recent research. The paper itself is in the nature of a summary but it is hoped that a full survey of the whole subject may soon be available.

H. S. Stannus.

STANNUS (Hugh S.). **Lymphogranuloma (Poradenitis) Inguinale: Infection acquired in England.** With a Note on the Pathological Findings by G. Marshall FINDLAY.—*Lancet.* 1933. Feb. 18. pp. 358–359. With 1 text fig.

The history of the first proved case of L.I. whose infection was acquired in this country.

The diagnosis was confirmed by animal inoculation. Infection was acquired from an English girl in Soho. In his paper, above reviewed, Stannus maintained that, contrary to the general opinion expressed in the discussion, the disease was surely present in Great Britain as in Germany, France and elsewhere, but that it was possibly passing unrecognized. By a strange coincidence this case came under his care in hospital just at the time that paper was read. *H. S. S.*

v. VERESS (Franz). Beiträge zum gehäuften Vorkommen der Lymphogranulomatosis inguinalis und deren Behandlung. [**Increased Occurrence of L.I. (in Rumania): its Treatment.**]—*Dermat. Woch.* 1933. Feb. 11. Vol. 96. No. 6. pp. 201–203.

In the town of Klausenburg (Rumania) during the past few years cases of L.I. have been increasing in numbers. A many sided form of treatment is advocated.

Whereas the author only recollects having seen during the earlier part of this century two probable cases of L.I., the total number coming under observation during the last four or five years in three clinics in Klausenburg is about one hundred and fifty, half this number being among students between 20 and 30 years of age. In regard to treatment generous diet, abundance of vitamins and tonics are needed. Injections of small doses of proteins at frequent intervals are useful. Local exposures to weak X rays 2X with 2/3 mm. aluminium filter reaching an E.D. in 8–10 days, then repeated after an interval of a month. Galvanopuncture of areas of softening and 10–15 minutes daily Bier's hyperaemic treatment. Fistulous tracks are touched with carbolic and trypaflavine gauze drains inserted. Complete healing obtained in 4–8 weeks. *H. S. S.*

POLAK (H. J.). Lymphogranulomatosis inguinalis und Urethritis non specifica. [**L.I. and Non-Specific Urethritis.**]—*Dermat. Woch.* 1933. Feb. 18. Vol. 96. No. 7. pp. 233–235.

The author admits the identity of climatic bubo and lymphogranuloma inguinale. Many cases were seen in Java.

He lays stress on the importance of recognizing a non-specific [*i.e.*, a non-gonorrhoeal] urethritis as the initial symptom. The primary lesion may lie within the urethra and give rise to a urethral discharge. In

uncomplicated cases the discharge is abacterial. The bubo appears some weeks later. In some cases it is possible that the adenopathy may be minimal. Three cases are cited in which the urethritis as well as the bubo cleared up under treatment with neostibosan. All cases of " non-specific " urethritis should be subjected to a Frei skin test before the appearance of a bubo and patients submitted to treatment early.

H. S. S.

MEYER (Edda). Ein Fall von endemischem (?) klimatischen Bubo.—[**A Case of Endemic (?) Climatic Bubo.**]—*Dermat. Woch.* 1932. Dec. 29. Vol. 95. No. 52. pp. 1864–1867. With 1 fig.

A typical case of L.I. from Delbanco's clinic, Hamburg, in which it is *suggested* that the patient, a 30-year-old woman, *may* have been infected by the man who lived with her, he in turn by a prostitute who acquired her disease from a sailor who contracted C.B. in a foreign country.

The woman exhibited bilateral bubo of two weeks' standing; seven months before she had had an abscess in Douglas' pouch evacuated by vaginal incision. The adnexa were fixed but no thickening remained; there were no lesions in the vagina or vulva; no evidence of tuberculosis or syphilis. She gave a positive skin reaction with an L.I. antigen supplied by FREI and an antigen prepared from her own bubo gave a positive reaction in a case of C.B. infected in the tropics. Her male companion was said to be healthy but no mention is made of any skin test performed in his case.

[There is no evidence to suggest that the infection was due to a tropical strain of virus save the fact that it occurred in Hamburg.]

H. S. S.

FREI (W.). Der gegenwärtige Stand der Kenntnisse von der Elephantiasis genito-anorectalis (Esthiomène, entzündliche Rektumstriktur). [**Present State of Knowledge of Genito-Anorectal Syndrome.**]—*Deut. Med. Woch.* 1933. Dec. 9. Vol. 58. No. 50. pp. 1964–1966.

After mentioning something of the history of the recognition of the genito-ano-rectal syndrome as a result of L.I. virus infection and making allusion to the fact that the syndrome is often incomplete with the production of elephantiasis alone or rectal stricture unassociated with other lesions, Frei refers to those more abortive forms which may be easily missed such as a single chronic ulcer in the anal region or a condition of elephantiasis limited to the external opening of the female urethra.

In about 80–85 per cent. of collected cases of this syndrome Frei's cuti-reaction using an L.I. antigen has been positive. Whether among the 15–20 per cent. negatives some other cause has been at work Frei will not venture an opinion; the negative is of no more value than the 20 per cent. of cases of tabes which give a negative W.R. He thinks that the animal experimental work in connexion with the genito-rectal manifestations all points to a causal association of L.I. virus with the conditions but still hesitates to accept them as part of one disease. The positive skin reactions given by L.I. patients infected with material from cases of elephantiasis or rectal stricture he terms pseudo-reactions. In regard to the histological picture too, he is in doubt whether the

tissue reaction is truly a reaction to a virus which is present or more of the nature of a reaction in a sensitized tissue excited by a non-specific antigen. *H. S. S.*

JERSILD (O). Elephantiasis genito-anorectalis. [**Genito-Anorectal Elephantiasis.**]—*Dermat. Woch.* 1933. Mar. 31. Vol. 96. No. 13. pp. 433–438.

Jersild has investigated 12 cases of the genito-ano-rectal syndrome which he divides into : *A*. 5 cases of syphilome ano-rectal, cases with peri-rectal and peri-anal infiltration stricture and fistula but no genital changes : *B*. 6 cases of elephantiasis genito-anorectalis, cases as in A. but combined with genital elephantiasis : *C*. 1 case of esthiomène (Huguier), vulval elephantiasis without involvement of the anus and rectum but with a stricture of the vagina 6 cm. above the hymen and stricture of the urethra.

In all the W.R. was negative. 8 of the total were [nevertheless] syphilitic but in 4 of these it could be proved that the rectal symptoms had preceded the syphilitic infection by 3 to 10 years. In two-thirds of the cases therefore syphilis could be excluded as a cause. In three cases the gonococcal complement fixation test was done, in 2 it was negative, in 1 doubtful. Examinations for gonococci were negative in all. The Dmelcos test was performed in 11 cases ; in 8 it was negative, in 1 doubtful, in 2 positive. The Frei intradermo-reaction with L.I. antigen was positive in 11 out of the 12. In the remaining case, one presenting the complete syndrome and the scars of previous inguinal buboes, the reaction was doubtful with one antigen and negative with another. An antigen prepared from pus obtained by expression of a para-rectal abscess in this case gave a positive skin test in a number of L.I. patients and negative results in controls. Similar cases have been reported by NICOLAS and by FREI but the value of this reaction is considered doubtful by FREI. The husbands of three of Jersild's cases, all of whom had had inguinal buboes, were submitted to Frei's test ; all were positive, Dmelcos test negative.

Jersild supports FREI in believing that these cases of the genito-ano-rectal syndrome are of L.I. origin. The few cases which do not give a positive L.I. skin reaction might be explained in several ways. RAVAUT has shown in 2 Frei skin reaction negative cases that the haemo-reaction by intravenous injection of antigen was positive.

Jersild like FREI is very cautious in regarding all cases as of L.I. aetiology and in regard to the evidence afforded by the pathological changes thinks that he has found only the picture of chronic inflammation in contra-distinction to BARTHELS and BIBERSTEIN, NICOLAS, FAVRE, MASSIA and LEBEUF who believe the changes are specific in character. *H. S. S.*

STRAUSS (H.). Zur Frage der Ätiol edogier " venerischen " Rektalstrikturen. [**Aetiology of Venereal Rectal Stricture.**]—*Dermat. Woch.* 1933. Feb. 18. Vol. 96. No. 7. pp. 235–238. [14 refs.]

A short general recapitulation of some of the evidence in favour of believing that so-called inflammatory stricture of the rectum is caused by an infection with the virus of L.I.

The author thinks that associated infections with other venereal diseases may play a part. The results of other observers using Frei's

test upon cases of rectal stricture are quoted showing the overwhelming majority of positives. The few negative results the author believes are due to the use of an unsuitable antigen. *H. S. S.*

KALZ (Friedrich). Rekonvaleszentenserum bei Lymphogranuloma inguinale. [**Convalescent Serum in L.I.**]—*Dermat. Woch.* 1932. Dec. 17. Vol. 95. No. 51. pp. 1839–1842.

Dissatisfied with the results of treatment by stibenyl, fouadin, neostibosan, solganal B in watery solution, and rays, also intraglandular injections of serum, of glycerine, radio-active solutions, etc., the author treated 4 cases by means of intramuscular injections of serum from convalescent L.I. patients in 5 cc. doses. They were all early cases. In one thirteen injections were given in seventeen days with a total of 65 cc.; no softening occurred and the swelling diminished much in size. In another case 77 cc. were given in 15 days after aspirating a softened gland. No fistulae formed, fluctuation and inflammation disappeared by end of second week. In a third case in which the iliac glands were also enlarged 25 days treatment with 104 cc. serum brought about good results. *H. S. S.*

LEVADITI (C.), RAVAUT (P.), SCHOEN (R.) & LEVADITI (J.). Le phénomène des " neuro-infections mortelles autostérilisables " chez les singes inoculés avec le virus de la maladie de Nicolas et Favre. [**Fatal Self-sterilizing Neuro-Infections in Monkey inoculated with L.I. Virus.**]—*C. R. Soc. Biol.* 1933. Feb. 3. Vol. 112. No. 4. pp. 359–363.

It has been shown that in the case of many neurotropic viruses, death may occur with frank signs of reaction to the virus infection, at the moment when sterilization of the tissue in regard to the virus has been effected.

The present communication records the same phenomena in the case of monkeys infected with the virus of L.I. and thus is explained the failure to infect monkeys by means of brain emulsions of other monkeys which exhibit typical pathological changes of infection. This interruption in the passage of the infection from monkey to monkey may be remedied by passage to mice in whom the virus may persist without symptoms of infection up to 87–108 days. *H. S. S.*

COHN (A.) & KLEEBERG (L.). Zur Lymphogranuloma inguinale-Infektion des Affen. [**L.I. Infection in the Monkey.**]—*Dermat. Woch.* 1933. Mar. 11. Vol. 96. No. 10. pp. 342–343.

Intraperitoneal injection of L.I. virus in monkeys causes no evidence of meningo-encephalitis on histological examination.

Monkeys were injected intraperitoneally with 4 cc. of L.I. gland pus. On the sixth day they were killed, having shown no symptoms and emulsions were made of portions of omentum and meninges. These after sterility tests, etc., were used as antigens and Frei's test was made in three patients suffering from L.I. and 8 controls. In 6 of the 8 controls the result was negative, in 1 there was slight reddening of the skin, in another an infiltration the size of a pin head. The antigen prepared from the omentum gave rise to a definite infiltration in all cases. The meningeal antigen caused in one case a small papule, in the second a just visible papule, and in the third a definite infiltration.

The authors believe these results prove the presence of virus in the meninges. [The statements as they stand should be received with reserve.] *H. S. S.*

LEVADITI (C.), RAVAUT (P.), VAISMAN (A.) & SCHOEN (R.). Réceptivité du chat à l'égard du virus lymphogranulomateux. Neuro-infection autostérilisable. [**Susceptibility of the Cat to L.I. Virus.**] —*C. R. Soc. Biol.* 1933. Jan. 13. Vol. 112. No. 1. pp. 48–50.

Continuing some experiments already referred to in this *Bulletin* [*ante* p. 128], Levaditi and his colleagues have obtained some degree of success in passaging the virus of L.I. in cats.

A brain emulsion from a Cynocephalus baboon at the 38th passage, "Kamm strain," was introduced intracerebrally into a cat. The animal developed symptoms on the 12th day and died the following day. On examination the brain was sterile to culture but exhibited the typical changes of a L.I. infection. Brain fragments from this case after 4 days in the ice-chest were emulsified and inoculated intracerebrally into a second cat. This animal died on the 9th day and showed at autopsy similar changes. Passaged to a third cat no symptoms were manifest but characteristic lesions were found when it was killed on the 18th day. A fourth cat inoculated from the third rapidly lost flesh and died on the 13th day with no symptoms and no evidence post-mortem of infection. Levaditi alludes to this result as an "auto-sterilization" and speaks of "neuro-infections mortelles auto-sterilisables." *H. S. S.*

FREI (W.), WIESE (J.) & KLESTADT (F.). Harnröhrensekret und Lymphogranuloma inguinale-Reaktion. (Grenzen der sog. Umkehrreaktion.) [**Urethral Secretion and the L.I. Reaction.**]—*Klin. Woch.* 1932. Dec. 17. Vol. 11. No. 51. pp. 2114–2116.

While the absolute specificity of the cuti-reaction which now goes by the senior author's name is upheld, Frei utters a warning regarding conclusions based upon the indirect method of making the test, that is the use of pus from a suspected case of L.I. as the antigen for a skin test in a known case of L.I., and still more the use of discharges from open lesions such as a bubo fistula, a suspected L.I. urethritis or pus or tissue from cases of the genito-ano-rectal syndrome.

In the present article the authors discuss the problem in regard to a case of urethritis the pus from which gave positive skin reactions in L.I. patients. The case was negative to L.I. antigen skin tests and the pus injected into a monkey failed to infect. Frei appears to think the reaction is a non-specific one but allows that further observations will be necessary before this particular case can be explained. *H. S. S.*

ARENAS (Normando). Estiomene de la vulva.—*Semana Méd.* 1932. Nov. 10. Vol. 39. No. 45 (2026). pp. 1377–1386. With 5 figs. [35 refs.]

CALLOL (F. Garriga) & FLO (M. Piera). Algunos casos de linfogranulomatosis inguinal de Nicolas y Favre.—*Rev. Méd. Barcelona.* 1932. Dec. Vol. 18. No. 108. pp. 515–522. With 3 figs.

CASTRONUOVO (G.). Bubbone climatico e forme analoghe. (Malattia di Nicolas e Fabre o quarta malattia venerea o linfogranuloma venereo. Sindromi relative: genito-ano-rettali, ulcero-serpiginose, proliferanti, elefantiasiche, stenosanti.)—*Giorn. Ital. di Malat. Esot. e Trop.* 1933. Feb. 28. Vol. 6. No. 2. pp. 29–36. With 8 figs.

GRANULOMA VENEREUM.

MENON (T. Bhaskara). **Studies on Inguinal Granuloma.**—*Indian Med. Gaz.* 1933. Jan. Vol. 68. No. 1. pp. 15–20. With 5 figs.

A general description of the disease as met with in Southern India, pointing out at the same time that in the author's opinion there is in a majority of cases an initial genital lesion.

Of 61 cases studied—38 were Tamil, 18 Telugus, 4 Mohammedan Tamils, 1 Malayali ; no cases among Europeans or Anglo-Indians were seen. There was equality in sex incidence. The age incidence was that of sexual maturity. In three-quarters of the male cases there was according to the author a history of a primary penile lesion. Since the infection is auto-inoculable lesions may be seen elsewhere than about the pudenda and contiguous areas. Cases in which the lips, nose, cheek, larynx, the skin of a limb, etc., have been affected are discussed. Viceralization was never seen in Madras. In some cases an inguinal bubo is described, in others merely gland enlargement. Among women "a true non-filarial elephantiasis of the vulva may occur." [In the absence of proof to the contrary it does not appear at all certain that many of the cases seen by the author were not cases of mixed infection —granuloma venereum and climatic bubo infections.]

H. S. Stannus.

WILLIAMSON (Thomas V.), with the Co-operation of James W. ANDERSON, Raymond KIMBROUGH & Austin I. DODSON. **The Specific Effect of "Fouadin" (Fuadin) on Granuloma Inguinale. Preliminary Report.**—*Jl. Amer. Med. Assoc.* 1933. May 27. Vol. 100. No. 21. pp. 1671–1676. With 11 figs. [Summary appears also in *Bulletin of Hygiene.*]

Fouadin, so named in honour of King Fuad, is stated to be antimony-III-pyrocatechin-sodium disulphonate and was found by Prof. KHALIL, University of Cairo, to be superior to other antimony compounds in the treatment of bilharziasis. This led the authors to try it in the treatment of granuloma inguinale [not to be confused with lymphogranuloma inguinale]. The preparation is used in a 7 per cent. solution, and the doses for adults, given intramuscularly, appear to have been on the lines recommended for bilharziasis by the Egyptian workers viz., 1·5, 3·5, and 5·0 cc. on successive days followed by 5·0 cc. on alternate days to a total of 10 to 12 injections. No dangerous effects were noted in the treatment of 14 cases, and the authors conclude that fouadin is a safe and rapid specific for granuloma inguinale. The article is illustrated by numerous photographs illustrating cases before and after treatment.

L. W. Harrison.

GHOSAL (J. N.). A Case of Granuloma Inguinale.—*Indian Med. Gaz.* 1932. Sept. Vol. 67. No. 9. p. 523.

MURRAY (A. J.). Granuloma Inguinale. Notes on a Chronic Case Successfully Treated with Ultra-Violet Radiations.—*West African Med. Jl.* 1932. Oct. Vol. 6. No. 2. p. 31.

MEDICAL ENTOMOLOGY.

HINMAN (E. Harold). **The Use of Insects and Other Arthropods in Medicine.**—*Jl. Trop. Med. & Hyg.* 1933. May 1. Vol.. 36 No. 9. pp. 128–134. [17 refs.]

The author's summary gives an adequate account of this paper :—

" This rather brief literature resumé calls attention to the value of arthropods in the practice of medicine. The rôle of their extracts and by-products in materia medica, the importance of insect-borne infections in the treatment of paresis, maggots as surgical aids in osteomyelitis, the stitching of wounds by the mandibles of ants and beetles, the possibility of diagnosing human infections through arthropods and finally the rôle they may play in preventive medicine, either in biological control or in the manufacture of immune preparations, all emphasize their latent worth. Thus the Anopheles mosquito, normally a dreaded enemy owing to its malaria-transmitting potentialities, may be deflected from its customary course to inject the parasites from its salivary secretion into the victims of general paralysis, the revolting maggots may be directed to feed upon the micro-organisms in osteomyelitic lesions, the virulent *Dermacentor andersoni* may be converted into Rocky Mountain spotted fever vaccine and certain parasitic or predacious species turned loose upon arthropods transmitting human infections. Truly our greatest enemies may prove useful to us."

Apropos of " xenodiagnosis " and the finding of ASHBURN and CRAIG, and STRONG, that microfilariae are more numerous in blood imbibed from men by the insect host than in blood removed artificially the author made experiments, which he describes, on the possible chemotactic effect of the salivary secretion of mosquitoes on the microfilariae of the dog (*Dirofilaria immitis*). The results were equivocal.

A. G. B.

HECHT (Otto). Experimentelle Beiträge zur Biologie der Stechmücken. II. [**Biology of Mosquitoes : Experimental.**]—*Ztschr. f. angewandte Entom.* 1932. Dec. Vol. 19. No. 4. pp. 579–607. [44 refs.]

This paper deals with three questions : the phenomenon of hibernation in mosquitoes, the oviposition of *Culex pipiens* in the absence of a blood meal, and the importance of temperature stimuli in inducing oviposition.

(i) In the case of *Anopheles maculipennis*, hibernation involves at least a partial dissociation of blood digestion and the maturation of eggs. Thus mosquitoes fed during the winter and kept at low temperatures digest the blood without producing eggs ; at high temperatures a certain proportion produce eggs, though not so rapidly as summer mosquitoes under the same conditions. In the case of *Culex pipiens*, the ingestion of blood during the winter *always* leads to the maturation of eggs, although this is naturally delayed at low temperatures. (i)) This same readiness of *Culex pipiens* to oviposit is shown by the egg-laying of females which have not fed in the adult

stage. Hecht's observations on this subject confirm those of previous writers. (iii) When offered a series of vessels containing water at different temperatures, *Culex pipiens* oviposits by preference between 20°C. and 30°C., mostly at the upper part of this range ; almost never at temperatures above 32° or under 18°. The influence of temperature in inducing oviposition is much more effectual than chemical stimuli arising from foul water or hay infusion ; although such stimuli may render water attractive at temperatures which otherwise would be avoided. *V. B. Wigglesworth.*

HECHT (Otto). Experimentelle Beiträge zur Biologie der Stechmücken. IV. [**Biology of Mosquitoes : Experimental.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1933. May. Vol. 37. No. 5. pp. 256–271. [19 refs.]

In previous publications Hecht has described the relation between feeding and the maturation of eggs in *Anopheles maculipennis* at different seasons of the year and different temperatures, but without taking into consideration possible differences between various races of *A. maculipennis*. In the present paper he compares the race with grey eggs and the race with barred eggs, and finds that these behave alike. During the summer, both can mature their eggs on a single meal of blood. Only if the temperature is too high or too low do a few individuals fail to produce ripe eggs ; under these unfavourable conditions the addition of sugar to the diet leads to increased egg production. In the winter, also, both races show " gonotrophic dissociation " to the same degree : that is, at low temperature blood sucking leads to fat body formation, but at higher temperatures a certain proportion will develop eggs. *V. B. Wigglesworth.*

SHUTE (P. G.). **The Life-History and Habits of British Mosquitoes in Relation to their Control by Antilarval Operations.**—*Jl. Trop. Med. & Hyg.* 1933. Mar. 15. Vol. 36. No. 6. pp. 83–88. With 1 fig.

In anti-mosquito, or rather anti-larval operations, correct identification of the species to be dealt with is the first essential ; next in order of importance comes a knowledge of the life-history, by the aid of which not only may breeding-places be determined and an attack thereon be launched to the best advantage, but futile expenditure of money, time and labour may be avoided. Thus, while the blood-thirsty *Ochlerotatus detritus* of our coastal districts probably produces many generations annually, other species such as *O. rusticus* and *Aëdes cinereus* are single-brooded, so that in their case anti-larval operations, if carried out at the right time, need not be undertaken more than once in the year. All who may be required to conduct such campaigns may derive much profit from a study of the highly interesting notes comprised in the present paper, accompanied as they are by a chart showing at a glance the stages in which twenty out of the twenty-eight British species of mosquitoes are to be met with throughout the year. *E. E. A.*

WEST (Augustus P.) & RUSSELL (Paul F.). **Paris Green Partially Adsorbed on Charcoal as a Larvicide for Anopheles Mosquitoes: Larvicide Studies, II.**—*Philippine Jl. Sci.* 1932. Aug. Vol. 48. No. 4. pp. 545–562. With 2 plates. [14 refs.]

RUSSELL (Paul F.) & WEST (Augustus P.). **Some Studies in the Larvicidal Effects of Arsenicals other than Paris Green against Anopheles Larvae: Larvicide Studies, III.**—*Ibid.* Sept. Vol. 49. No. 1. pp. 97–103.

WEST (Augustus P.) & RUSSELL (Paul F.). **Experiments with Various Toxic Substances Partially Adsorbed on Charcoal as an Anopheles Larvicide: Larvicide Studies, IV.**—*Ibid.* Oct. Vol. 49. No. 2. pp. 211–217. With 1 plate.

RUSSELL (Paul F.) & WEST (Augustus P.). **The Effect on Culex Larvae of Paris Green diluted with Charcoal and Notes on the Feeding Habits of *Culex quinquefasciatus*: Larvicide Studies, V.**—*Ibid.* Dec. Vol. 49. No. 4. pp. 651–675. With 3 plates & 1 fig.

These four papers describe attempts at improving and cheapening the existing larvicidal dusts.

In Paper II laboratory tests are described in which poisons have been adsorbed on wood charcoal instead of being simply mixed with charcoal or other diluent as is the usual practice. If a substance is successfully adsorbed, every particle of charcoal should be poisonous, whereas in simple mixtures the particles of diluent are harmless to the larvae. The charcoal used would pass through a 50-mesh sieve. Five grams of charcoal with the requisite amount of Paris green and other substances were mixed with 60 cubic centimetres of water and stirred and heated at 90°C., and then evaporated to dryness and powdered. It is claimed that partial adsorption of the Paris green results, and tests are described which show that "low concentrations of Paris green, less than 1 per cent., proved to be as efficacious as the standard 1 per cent. mixtures of Paris green and diluent as ordinarily used."

In Paper III, other arsenical preparations were mixed with charcoal in the usual way. Paris green proved more efficient than any other preparation such as barium arsenite, lead arsenite or arsenic trioxide. It is concluded that the copper in the Paris green plays an important part.

In Paper IV, various heavy metallic poisons (nickel chromate, barium chloride, etc.) and other substances, such as pyrethrum powder, nicotine, tannic acid, nitre cake and rotenone, "partially adsorbed" on powdered charcoal were tested, but none was as effective as Paris green.

In Paper V, it is shown that Paris green mixed with charcoal and applied on the surface of water in the ordinary way will kill most and sometimes all of the Culex larvae as well as the Anopheles, since Culex larvae spend much of their time feeding at the surface.

V. B. Wigglesworth.

POLITOFF (A.). [**Experimental Application of Chlorpicrin and Carbon Bisulphide in the Control of Mosquito Larvae and Pupae.**]—*Med. Parasit. & Parasitic Dis.* Moscow. 1932. Vol. 1. No. 1. pp. 32–36. [In Russian.]

A series of experiments was conducted on the application of chlorpicrin (CCl_3NO_2) and carbon bisulphide (CS_2) in the destruction of mosquito larvae and pupae. When added to water chlorpicrin usually

sinks to the bottom, though it can also float on the surface when finely sprayed. Its solubility is very low (10·65 gm. in 1 litre of water at 18°C.). The effect of this chemical upon immature mosquitoes was tested both under laboratory and under natural conditions. In the first case it was found that a 1 per cent. mixture killed the larvae and pupae in 5–6 minutes; 0·1 per cent. killed up to 90 per cent. of the larvae during the first half hour; 0·001 per cent. acted more slowly destroying practically all the larvae in 22 hours. The action of chlorpicrin upon the pupae is considerably slower. Chlorpicrin acts both chemically and physically: it poisons the insects and is adhesive. It also kills the other animals, as well as plants, usually found in the natural habitat of the developing mosquitoes, such as insects, crustaceans, fish and tadpoles. The drinking of water containing chlorpicrin in doses 100 times larger than those which kill mosquito larvae, has no harmful effect upon larger animals.

The method was tested under natural conditions in two ways: (1) by spraying 100 gm. of chlorpicrin over the surface of ponds and small swamps; (2) by placing a vessel containing the same amount of chemical at the bottom of the water. The results were tested by placing sieves at the bottom and counting the number of dead young mosquitoes after a short interval. It was found that spraying produced considerably better results. The subsequent dosage used for spraying swamps was about 0·01–0·02 gm. per litre. The use of chlorpicrin in field work is recommended for the following reasons: (1) cheapness, since a single application "charges" the water for an indefinite period; (2) rapid and certain action upon the larvae; (3) harmless effect upon domestic animals drinking such water; and (4) independence from atmospheric conditions. Carbon bisulphide was tested in the same way as chlorpicrin. It has a similar effect upon the young stages of mosquitoes, but being less toxic requires larger doses.

C. A. Hoare.

i. GATER (B. A. R.). **Notes on Malayan Mosquitoes, I. The Genus *Anopheles*. II. Seasonal Distribution.**—*Malayan Med. Jl.* 1933. Mar. Vol. 8. No. 1. pp. 39–42; 43–45. With 6 figs.

ii. MILNE (J. Coutts). **Some Malayan Culicines.**—*Ibid.* pp. 46–49. [10 refs.]

i. In the Malay Peninsula twenty-nine species of Anopheles are known to occur, and there may be more. These "Notes," to be continued regularly, are intended "to keep those interested in the practical side of mosquito examination and control informed of the progress of our knowledge." The first paper provides a list of Malayan Anopheles fully authenticated and otherwise, together with notes upon many of them. Pending a comprehensive mosquito survey of the country, an appeal is made for material to be sent to the King Edward VII College of Medicine, Singapore, for expert study and record.

The second paper gives the results obtained by aid of a mosquito trap set on a malarious estate for 198 nights in one year, and also by searching rooms in adjacent coolie lines "on the morning after each night on which the trap was operated." In all, 36,502 mosquitoes, of which 5,442 were anophelines, were caught and examined. It was found that Malayan mosquitoes generally, but especially anophelines, are averse from remaining in houses during the day; and that in

the case of six anophelines and three culicines, there is a seasonal periodicity not always in harmony with conclusions from larval surveys. Should there prove to be a constant seasonal variation in the numbers of adults of malaria-carrying species, the discovery will be of obvious importance.

ii. At certain seasons the town of Taiping is afflicted with a plague of mosquitoes, which is not confined to any special quarter. Milne furnishes a list of adult culicines taken in houses in Taiping, or reared from larvae found in collections of water within and beyond the oiling area, together with notes on breeding places. *E. E. A.*

DE JESUS (P. I.). **Hydrodynamics of Mosquito Breeding Places.**—*Amer. Jl. Hyg.* 1933. Mar. Vol. 17. No. 2. pp. 502–514. With 2 figs.

Anopheles minimus, "the most efficient vector of malaria in the Philippines," breeds in slowly flowing streams, and the object of the study described in the present paper was to determine the velocities of water tolerated by the larvae of this species during the dry and wet seasons.

Larvae were found where mean velocities ranged from, but did not exceed, 0·05 to 1 ft. per second. Ability to withstand flushing up to the latter speed may be due to the possession by the larvae of well developed grappling hooks at the tips of certain setae in the external supra-anal tufts. *A. minimus* larvae are swept away and breeding becomes impossible when the current is faster than 1 ft. per second. Breeding in this species is not limited to running water, but may also occur in seepage pools. *E. E. A.*

DE MEILLON (Botha). **On *Anopheles funestus* and its Allies in the Transvaal.**—*Ann. Trop. Med. & Parasit.* 1933. Apr. 10. Vol. 27. No. 1. pp. 83–97. With 3 graphs & 8 figs.

This work is an attempt to determine how far the different races or varieties of *Anopheles funestus* differ among themselves in their relation to malaria. The points of distinction between the larvae of *A. funestus* and *A. funestus* var. *leesoni* are described in detail and a key is given to these and closely allied species. In the adult stage *funestus* and its variety can be distinguished only in the male, but there is some evidence that var. *leesoni* does not enter houses so readily as the type form; as the author puts it, the former is not "homophilic" [perhaps "anthropophilic" or "androphile" would be less objectionable !]. Thus, although the position is not yet clear, recent researches suggest that in South Africa, differing biological behaviour within the same species will have to be taken into consideration. *V. B. Wigglesworth.*

GIBBINS (E. G.). **The Domestic *Anopheles* Mosquitoes of Uganda.**—*Ann. Trop. Med. & Parasit.* 1933. Apr. 10. Vol. 27. No. 1. pp. 15–25. [10 refs.]

The conclusions arrived at in this paper are based on collections made during four years in widely different regions of Uganda. The collections were made in the early part of the day in selected dwellings twice weekly by the same native collectors. In Uganda the prevalence of males in houses does not appear to be of much significance

as indicating proximity or otherwise of breeding places. Males occur more frequently in European houses, and it is suggested that light may be a factor of importance. *A. funestus* and *costalis*, the chief malaria-carrying species in Uganda (with a natural infection rate of 15–18 per cent.), show a decided preference for man; whereas *A. mauritianus* var. *ziemanni*, when it occurred in houses, was shown to be attracted by the presence of goats and was of far less importance in the natural transmission of malaria (infection rate 0·3 to 0·5 per cent.). Smoke of the amount usually produced by wood fires, when cooking is carried out within a native hut, does not appear to influence infestation by *A. costalis* and *funestus*. Dwellings surrounded by dense vegetation were found to be particularly attractive to Anopheline mosquitoes. *V. B. Wigglesworth.*

MARTINI (E.) & TEUBNER (E.). Über das Verhalten von Stechmücken besonders von *Anopheles maculipennis* bei verschiedenen Temperaturen und Luftfeuchtigkeiten. [**The Reactions of Mosquitoes, Particularly** *A. maculipennis*, **to Changes in Temperature and Atmospheric Humidity.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-hyg.* 1933. Vol. 37. No. 1. pp. 1–80 (1–80). With 10 figs. [61 refs.]

The problem of "anophelism without malaria" has formed the nodal point of most studies on the epidemiology of malaria, in Europe at least, during the last twelve years. But as the authors of this important paper point out, it is really a pseudo-problem, a state of affairs which may be brought about by a great variety of causes; and it should be the object of the malariologist to elucidate these causes separately in each locality. At the present day the favourite hypothesis to explain the absence of malaria in the presence of abundant *Anopheles maculipennis* is that this species has given rise to a number of "biological races" which, though morphologically alike, are distinguished by their food preferences; those in the malarious localities preferring the blood of man and those in the non-malarious localities preferring the blood of animals. Martini & Teubner, while admitting the possible validity of this hypothesis in certain localities, approach the problem from the other side; and consider whether the change that has banished malaria may not be in the environment and not in the mosquito: in other words, a change in the climate. Not the climate of the meteorologist, but the "micro-climate" where the mosquito seeks its food, or hibernates, or rests during digestion. Their thesis is that a very small change in the climate in such places may have far reaching effects upon the behaviour of the mosquito, and so upon the incidence of malaria.

There is nothing new in this idea; indeed, Martini advanced it more than ten years ago. But what is new is its critical examination by means of laboratory experiments correlated with observations in the field. The paper under review represents five years of work along these lines. The experiments consisted in determining the influence of temperature and atmospheric humidity on the duration of life of different species of mosquito, the preferred humidity at constant temperature, and the preferred temperature at constant relative humidity. Field observations concerned the climate of those situations in which wild mosquitoes were actually found during the summer and during hibernation. These sections are followed by a critical review on the present status of the "races" of *Anopheles maculipennis*.

It is impossible to reproduce the wealth of data which the authors adduce; only a few of their conclusions can be noted. The duration of life is greatly increased at high relative humidity in all the species studied (*Culex pipiens, Aëdes* (*Stegomyia*) *argenteus, Theobaldia annulata* and *Anopheles maculipennis*). But in the case of *A. maculipennis* excessive humidity is harmful, the optimum being about 80–90 per cent. In a chamber with graded humidity, all these species select the moister regions; though in the case of *A. maculipennis* this preference only appears at rather high temperatures. The readiness with which the mosquitoes would select their optimum temperature and humidity varied with their physiological state: young individuals were more sensitive, particularly if fasting, and summer mosquitoes more so than hibernating insects. *Stegomyia* showed the interesting phenomenon of "negative thermotaxis" (seeking the coolest spot) when the saturation deficit in the atmosphere exceeded 6 mm. In nature, *Culex pipiens* and *Theobaldia annulata* select sites for hibernation where the atmosphere is almost saturated; *A. maculipennis* chooses rather less moist spots. The evaporating power of the air is shown also to determine whether mosquitoes will fly and bite; and the micro-climate of the spot where the mosquito has sucked blood determines the duration of its stay.

These statements give only an inadequate impression of the ground covered by the authors; but their main contention is that, in some cases at least, the apparent food preferences of *A. maculipennis*, which determine the incidence of malaria, are really due to the interaction of the micro-climatic predilection of the particular race of insect and the micro-climatic conditions obtaining in the living rooms and stables. Their paper emphasizes the need for further investigation into the effects of climate upon insects. *V. B. Wigglesworth.*

SHIMIDZU (Seiichi). **Studies on the Larva of** *Anopheles vagus* **Dönitz** (*Anopheles formosaensis* **II Tsuzuki), discovered in Tainan.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1933. Apr. Vol. 32. No. 4 (337). [In Japanese. English summary pp. 47–48.]

The author found in Tainan larvae resembling those of *A. ludlowi* but from which emerged adults of *A. vagus*. *Vagus* larvae have not hitherto been found in Formosa. He describes the larval characters.

A. G. B.

i. ROUBAUD (E.), TOUMANOFF (C.) & GASCHEN (H.). Les données de l'indice maxillaire rapportées au rôle infectant des anophèles de l'Indochine septentrionale. [**The Data furnished by the Maxillary Index correlated with the Infectivity of the Species of** *Anopheles* **found in Northern Indochina.**]—*Bull. Soc. Path. Exot.* 1933. Feb. 8 & 9. Vol. 26. No. 2. pp. 282–293. With 5 figs.

ii. MORIN (H.). Au sujet de l'indice maxillaire des anophèles de l'Indochine septentrionale. (Essai d'analyse statistique.) [**Maxillary Index of the** *Anopheles* **of Northern Indo-China. (An Essay in Statistical Analysis.)**]—*Ibid.* pp. 293–300. With 2 figs.

i. It had previously been found by TOUMANOFF that the ordinary malaria carriers in Tonking are *Anopheles minimus, A. aconitus, A. jeyporiensis* and *A. maculatus*. The present paper is concerned with these species, and with *A. hyrcanus sinensis* and *A. vagus* in addition. The two latter, already known to be prone to feed upon animals, were found to have a maxillary index higher than 14; on

the other hand the other four species mentioned are definitely paucidentate, having a maxillary index in the neighbourhood of 11. These are therefore ill-equipped for feeding on animals, and are consequently much more dangerous to human beings. The information derived from the examination of the maxillary armament agrees with what is known as to the relative frequency of infection in the insects themselves, and it is urged that the systematic study of dentary indices, as a method of investigation, merits universal application.

ii. Except that *A. maculatus* is omitted, this paper, which likewise relates to Tonking, deals with the same species of Anopheles as the foregoing, and the system followed in the analysis is taken from that in current use for American percentile graphs. The result shows that, in Northern Indochina, the distribution of the denticles on the maxillae of female Anopheles is not fortuitous but specific; that the commonest Anophelines in districts where malaria is absent are multidentate; and that the three species which hitherto have always shown the highest percentage of natural infection with the malarial parasite are definitely paucidentate. It would seem that, where there are many species of *Anopheles*, the determination of the maxillary index, by enabling investigations to be confined to paucidentate species, would expedite the identification of the chief local vector.

E. E. A.

ROUBAUD (E.) & GASCHEN (H.). Insuffisance des caractères de l'oeuf pour la distinction des races trophiques et biologiques de l'*Anopheles maculipennis*. [**Insufficiency of the Egg-Characters for the Distinction of the Trophic and Biologic Races of** *Anopheles maculipennis*.]—*Bull. Soc. Path. Exot.* 1933. Mar. 8. Vol. 26. No. 3. pp. 447–451. With 5 figs on 1 plate. [11 refs.]

FALLERONI (1926) distinguished two typical races of *A. maculipennis* according to the morphological characters of the egg. One of these races (*A. maculipennis labranchiae*) lays eggs of dappled grey, with narrow floats; in the other the eggs have dark bands and larger floats. MARTINI, MISSIROLI & HACKETT (1932) have attributed special value to these distinctions from the point of view of anti-malarial praxis, and VERNEY (1932) is of opinion that the *labranchiae* race will shortly be considered the only malaria carrier in Europe. After discussing this contention with the aid of the "opulent terminology" now apparently inseparable from the subject, the present authors conclude that, when the possible relation of *A. maculipennis* to man is in question, the morphological characters of the eggs are of far from primary importance. It is from the maxillary index alone that sound deductions can be drawn.

E. E. A.

i. SERGENT (Et.) & TRENSZ (F.). Note préliminaire sur la morphologie des oeufs d'*Anopheles maculipennis* de France et d'Algérie. [**Preliminary Note on the Morphology of French and Algerian** *A. maculipennis* **Eggs.**]—*Arch. Inst. Pasteur d'Algérie.* 1933. Mar. Vol. 11. No. 1. pp. 9–11. With 2 plates.

ii. SENEVET (G.). A propos des races d'*Anopheles maculipennis*. [**Concerning the Races of** *A. maculipennis*.]—*Arch. Inst. Pasteur d'Algérie.* 1933. Mar. Vol. 11. No. 1. pp. 12–14.

i. *A. maculipennis* eggs from a locality in France which has long been healthy, and others from two malarious centres in Algeria were

found all to belong to the *labranchiae* (*atroparvus*) type, being light grey, irregularly banded or spotted, with striated floats nearer the pointed end. Thus the evidence against the diagnostic value of egg-characters for the distinction of malaria-carrying races of *A. maculipennis* accumulates (see ROUBAUD & GASCHEN above).

ii. This paper, which deals with adults and larvae, forms a supplement to the foregoing, and utilizes characters furnished by the male genital armature, and by the ante-palmate hairs on the fourth and fifth segments of the larval abdomen. Though the material examined is clearly insufficient as a basis for final conclusions, it was found that Algerian specimens, as also others from Argentat and Moustoulat in Corrèze, were referable to the *atroparvus* type ; on the other hand adults and larvae from Dordogne would appear to belong to the *messeaè* variety. *E. E. A.*

DE BUCK (A.), TORREN (G. V. D.) & SWELLENGREBEL (N. H.). **Report for the Year 1932 on Investigations into the Racial Composition of *Anopheles maculipennis* in Holland.**—Reprinted from *Riv. di Malariologia.* 1933. Vol. 12. No. 2. 18 pp. With 1 graph & 20 figs. on 4 plates.

To the reader of the papers by ROUBAUD & GASCHEN, and SERGENT & TRENSZ summarized above, the net result of this contribution to the study of " the problem of anophelism without malaria in Holland," otherwise the search for reliable distinctive characters of malaria- and non malaria-carrying races of *A. maculipennis,* may well be mental bewilderment. After setting up a number of possible criteria derived from eggs, larvae, and male and female adults, only to knock the majority of them down again like so many ninepins, the authors conclude that, in the pattern of the dorsal surface of their eggs, the Dutch long- and short-winged races of *A. maculipennis* differ as do the Italian varieties *messeae* and *labranchiae* ; and that, as regards reliability, the means of recognition thus afforded " surpasses all other morphological characters and can be compared with our best biological distinctives." *E. E. A.*

DE BUCK (A.) & SWELLENGREBEL (N. H.). **On Anophelism without Malaria around Amsterdam. IV. The Pattern of the Dorsal Surface of the Ova in the Two Races of *A. maculipennis*.**—Reprinted from *Proc. Roy. Acad. Sci. Amsterdam.* 1932. Vol. 35. No. 10. pp. 1335–1338. With 6 figs. (2 on 1 plate).

With the reservation that it is usually necessary to examine a whole batch of *A. maculipennis* eggs laid by one female, in order to determine whether the insect belonged to the short-winged or long-winged race, the former being associated with malaria while the latter is not, the authors agree with HACKETT, MARTINI & MISSIROLI (see this *Bulletin,* Vol. 29, p. 832) that " the pattern of the dorsal surface of the ova serves to identify individuals of each race." They differ, however, in ascribing this pattern, both types of which are clearly shown on the plate, not to pigment but to the arrangement of minute processes (columellae and knobs) from the exochorion. [In view of this discrepancy, and in spite of the identity of the dorsal pattern on the eggs, and of the morphology and " epidemiological significance" of the adults, it must, pending further investigation, remain doubtful

whether the racial differentiation of *A. maculipennis* in Italy and many areas in Germany on the one hand, and in Holland on the other, has followed an identical course.] *E. E. A.*

i. WEYER (Fritz). Untersuchungen zur Rassenfrage bei *Anopheles maculipennis* in Nordwestdeutschland. [**Investigations into the Question of Races in** *Anopheles maculipennis* **in N.-W. Germany.**] —*Zent. f. Bakt.* I. Abt. Orig. 1933. Feb. 23. Vol. 127. No. 7/8. pp. 397–417. With 2 figs. [20 refs.]

ii. SWELLENGREBEL (N.) & DE BUCK (A.). Les races hollandaises de l'*Anopheles maculipennis* et leurs rapports avec les races italiennes. [**The Dutch Races of** *Anopheles maculipennis* **and their Relations to the Italian Races.**]—*Bull. Soc. Path. Exot.* 1933. Feb. 8 & 9. Vol. 26. No. 2. pp. 273–281. [14 refs.]

i. East Friesland, which is very similar to North Holland in climate, physical characters and cultivation, and the only region in Germany wherein malaria is still endemic, was selected by Weyer as the scene of a series of investigations designed to determine how far the findings of the Dutch authors (see below) on the vexed question of races in *A. maculipennis* could be substantiated in North-West Germany. Though the results of the enquiry, as set forth in this paper, are often inconclusive, the following among other facts emerge. In N.-W. Germany it is possible to distinguish two races of *A. maculipennis* corresponding to the short- and long-winged races of the Dutch writers; the eggs laid by these races are respectively dappled and banded. Though found for the most part where water is brackish, the former race also occurs where it is fresh. The only true focus of malaria in Germany lies within the area of this race; on the other hand, even where the latter occurs, there may be large areas which are malaria-free. The maxillary index in this race is higher than in the other, which hitherto has only been found where there is no malaria. In both races size varies greatly according to season and place of origin.

ii. To the authors, the problem of the two races of *A. maculipennis* in Holland is primarily one of epidemiology rather than entomology, and the "essential" distinctive characters of these races—the short-winged race, which breeds in brackish water and alone transmits malaria, and the long-winged (freshwater) race—are biological rather than morphological (*cp.* ROUBAUD, this *Bulletin*, 1932, Vol. 29, pp. 831–832). As shown some years ago by ROUBAUD, and confirmed later by the authors, the short-winged race transmits malaria in the autumn because, passing the winter in a state of semi-hibernation, when in houses at this season, it continues to batten on blood though the maturation of the ova is temporarily suspended. In the long-winged race hibernation is complete, and feeding ceases when reproduction is inhibited by cold. While the Dutch short-winged (called by VAN THIEL in 1927 *atroparvus*) and long-winged races of *A. maculipennis* which respectively lay dappled and banded eggs, appear to be identical with the Italian varieties *labranchiae* and *messeae*, it is important to remember that, as shown last year by ROUBAUD, the short-winged race may nearly lose its dangerous character when, during the season of epidemic malaria, it displays and is able to exercise a predilection

for animal as opposed to human blood. Conversely the long-winged race may include a strain which has not developed a penchant for animal blood, and is therefore dangerous. With this exception, in Italy as in Holland, *A. maculipennis*, in so far as it transmits malaria, breeds only in brackish water, a fact which accords with ancient belief and is of obvious practical importance.

A short Appendix (termed a "Discussion") by Dr. ROUBAUD expresses general approval of the authors' statements, and stresses the importance of the maxillary index (see ROUBAUD & GASCHEN above) in the diagnosis of zoophily. *E. E. A.*

PATTON (W. S.). **The Identity of** *Culex aegypti* **L.** [Miscellanea].—*Ann. Trop. Med. & Parasit.* 1933. Apr. 10. Vol. 27. No. 1. pp. 182–184.

Many will doubtless sympathize with this plea for reversal of the recent (1932) decision by EDWARDS henceforth to apply Linnaeus's name *Culex aegypti* (1762) to the yellow fever mosquito, and retention, for this variously named species, of the better known designation *Aëdes* (*Stegomyia*) *fasciata*. It is contended that the characters given for *C. aegypti*, though generally applicable to both, point rather to *Ochlerotatus caspius* than to the latter species. On the other hand, after abandoning the use of *calopus*, American writers have used the name *aegypti* for more than a decade, although the leading German authority on mosquitoes employs *fasciata*. In view of the impossibility of identifying with certainty any one of the venerable descriptions involved, this diversity in nomenclature, regrettable though it be, will doubtless continue. *E. E. Austen.*

DOVE (W. E.), HALL (D. G.) & HULL (J. B.). **The Salt Marsh Sand Fly Problem (Culicoides).**—Reprinted from *Ann. Entom. Soc. of America.* 1932. Sept. Vol. 25. No. 3. pp. 505–522. With 2 figs. & 3 plates.

This paper is a preliminary report on the blood-sucking midges (Culicoides) occurring along the Atlantic and Gulf Coast littorals, where the annoyance due to the bites of these insects seriously affects the tourist business. The studies were limited to the grass type of salt marsh as opposed to the mangrove swamp. In such localities the "sand fly" larvae were found concentrated in decaying humus in the densely shaded areas at the edges of the marshes; and the only medium in which they could be reared in captivity was decaying grass roots and humus in brackish water. The larvae are probably dispersed when they are reached by high tides and also when they occur in ditches up which the tide can flow. On the other hand, partially blocked ditches favour "sand fly" breeding. For control, the authors advocate drying the ground in their breeding places by means of drainage or by trimming the shade trees near the edges of the grass marshes. A by-product in the treatment of timber with creosote, termed "phenolized pine sap" has proved very effective in killing the larvae under experimental conditions but it has not yet been tested in the field. *V. B. Wigglesworth.*

HALL (D. G.), HULL (J. B.) & DOVE (W. E.). **New Method in Sand Fly Studies (Diptera: Chironomidae).**—Reprinted from *Entom. News*. 1933. Feb. Vol. 44. No. 2. pp. 29–32. With 2 figs. on 1 plate.

Among other matters this paper includes a description of a simple light trap made to fit over the headlight of an automobile and useful for collecting insects such as Culicoides that are attracted to light.

V. B. Wigglesworth.

v. SZENTKIRÁLYI (S.) & v. LÖRINCZ (F.). Ueber eigenartige infolge von Phlebotomusstichen hervorgerufene Dermatosen. Das Vorkommen von Phlebotomus in Ungarn. [**A Peculiar Dermatitis caused by the Bites of Phlebotomus in Hungary.**]—*Dermat. Woch.* 1933. Mar. 4. Vol. 96. No. 9. pp. 289–296. With 6 figs. [10 refs.]

During August 1931 about 30 patients were observed in Hódmezövásárhely suffering from an unfamiliar type of dermatitis. This began with intense itching and was followed next day by a papular or vesicular eruption occurring always on the exposed parts of the body; and proved to be caused by the bites of Phlebotomus [the species is not reported], an insect that does not appear to have been recorded before from Hungary. The course of the eruption is fully described in several cases and illustrated by photographs. There was much variation in detail between different individuals; in some cases where the local reaction was very pronounced there were severe general "toxic symptoms." The incrimination of Phlebotomus was confirmed by producing the same symptoms experimentally by its bite. All these findings agree exactly with those of DOSTROWSKY on "harara" or what he calls *urticaria multiformis externa* (*e phlebotomica*) in Palestine in 1925: a widespread dermatitis caused by the bites of Phlebotomus [see this *Bulletin*, Vol. 23, p. 402]. The authors could not satisfy themselves whether the condition was of an anaphylactic nature; certainly it did not develop in all persons who were bitten. The sudden appearance of the disease and the insect in 1931 is attributed to the exceptionally high mean temperature in the summer of that year.

V. B. Wigglesworth.

PATTON (W. S.). **Studies on the Higher Diptera of Medical and Veterinary Importance. A Revision of the Genera of the Tribe Muscini, Subfamily Muscinae, based on a Comparative Study of the Male Terminalia. I. The Genus *Musca* Linnaeus.**—*Ann. Trop. Med. & Parasit.* 1933. Apr. 10. Vol. 27. No. 1. pp. 135–156. With 11 figs.

In the act of sucking blood as practised by a tsetse-fly or a Stomoxys, a considerable portion of the actual proboscis is thrust into the victim. A blood-drinking species of the genus *Musca*, on the other hand, albeit equipped with teeth and other offensive armament on its prestomal sclerite, cannot do more than remove a scab, or at most scratch and tear the skin. Its proboscis is therefore not an actual piercing instrument, and structural differences in this organ between species of *Musca* which are phlebotomic, and others such as *M. domestica* which are not, are differences of degree and not of kind. This paper is devoted to showing, by means of description and graphic illustration,

that the grouping of the species of *Musca* previously established by the author, on the basis of the male terminalia [*ante*, p. 309], is confirmed by the structure and action of the proboscis in the blood-sucking forms. The method of drawing blood by various species is described and in some cases illustrated.

The author hopes, in his next paper to be published in this series, to investigate the right of "the many genera erected in *Stomoxys* (sens. lat.)" to continued existence [in which connexion again see this *Bulletin, loc. cit.*]. *E. E. A.*

BEDFORD (George V.), WILLIAMS (Donald H.) & NEWTON (M. V. B.). **Creeping Eruption, with Special Reference to Cutaneous Myiasis and Report of a Case.**—*Canadian Med. Assoc. Jl.* 1933. Apr. Vol. 28. No. 4. pp. 377–382. With 3 figs. [36 refs.]

A case of larva migrans caused by the larva of the bot-fly, *Gastrophilus intestinalis*, is described. This occurred in a farmer from the region of Winnipeg, and was of one month's duration. "The eruption presented itself as a tortuous raised and palpable dark brown linear lesion. For about one inch the lesion was acutely inflamed, and presented the appearance of an herpetic eruption, five or six vesicles being grouped together." When clear machine oil was applied, a black dot could be seen. This was removed with the point of a needle and proved to be the first stage larva of *G. intestinalis*. The subject of "creeping eruption" is reviewed at some length, and it is pointed out that at least seven different parasites have been found causing the condition, most cases probably being due to nematode worms of which *Ancylostoma braziliense* is the commonest.

V. B. Wigglesworth.

GERTSON (G. D.), LANCASTER (W. E. G.), LARSON (G. A.) & WHEELER (G. C.). **Wohlfahrtia Myiasis in North Dakota. Report of Two Cases.**—*Jl. Amer. Med. Assoc.* 1933. Feb. 18. Vol. 100. No. 7. pp. 487–488. [10 refs.]

Two cases of myiasis due to *W. vigil* are described from North Dakota; one in the base of the penis of an infant of 4 months, the other in the upper eyelid of an infant of 8 months. References to previous cases from the same region are given.

V. B. Wigglesworth.

NASH (T. A. M.). **The Ecology of** *Glossina morsitans*, **Westw., and Two Possible Methods for its Destruction.—Part I.**—*Bull. Entom. Res.* 1933. Mar. Vol. 24. Pt. 1. pp. 107–157. With 8 figs. (4 on 2 folding plates).

Although *Glossina morsitans* was first encountered by an Englishman nearly a century ago, no adequate account of the ecology of this vector of human and animal trypanosomiasis has hitherto appeared. The present contribution, which is the result of four and a-half years' observation by its author at the Kikori Entomological Station, in Tanganyika, is therefore to be welcomed. The facts and conclusions recorded are derived from three different "fly-rounds," *i.e.*, surveys of tsetse along fixed routes, "repeated at definite short intervals throughout the year," during which there are two dry and two wet seasons.

A paper of the length of this, packed with facts, clearly cannot be compressed into a few paragraphs; all that is possible is to mention certain of the more important points.

In a *G. morsitans* belt the fly varies in abundance from year to year, and according to season; pupae invariably perish if immersed in water or buried in water-logged soil for more than four days; thus abnormally heavy rainfall may almost exterminate the insect, but years of low rainfall are favourable to the fly. If the seasonal bush fires be suppressed the fly community at first benefits, but afterwards suffers when the old grass mixed with new becomes unattractive to game. In the development and activity of the fly, temperature is not of primary importance. The longevity of the insect depends upon evaporation, and "seasonal fluctuations in fly density can be correlated with fluctuations in the evaporative power of the air." *G. morsitans* decreases in numbers when evaporation exceeds or falls below a mean monthly rate of 20–25 cc. a day, which stimulates breeding "and results in a maximum density in the following month;" towards the end of the dry season the fly population diminishes.

Such as deny the efficacy of wholesale destruction of big game for the abolition of tsetse will be gratified to learn that, "of the three great factors—season, vegetation and game," the author considers the last of least importance. "Only large game movements produce noticeable effects upon the fly community," which may conceivably flourish at the expense of the wart-hog, a favoured and ubiquitous host. As for the vegetation factor, *Brachystegia microphylla* woods are much more attractive to *G. morsitans* than any others, so that in the fly-belt under consideration effective reclamation might be secured by clearing only these and *Berlinia* woods, wherein breeding also occurs.

Well defined game paths converging upon water-holes, or even paths cut for the purpose, appear to act like so many Ariadne's threads to hungry tsetse, which travel along them until a fly concentration is produced. Should an effective trap for *G. morsitans* be devised, it might be possible to deal successfully with a large area of fly by means of such a trap placed "at the junction of paths cut to meet in a point," perhaps with the addition of a trap at the opposite end of each path to receive tsetse flying the wrong way.

In the final section of the paper the activities of *G. swynnertoni*, *G. palpalis* and *G. pallidipes* are compared with those of *G. morsitans*.

E. E. A.

GALLIARD (H.). Glossines du Gabon occidental. [**Western Gabun Tsetse-Flies.**]—*Ann. Parasit. Humaine et Comparée.* 1933. Mar. 1. Vol. 11. No. 2. pp. 81–92. With 1 map & 1 fig.

The tsetse-flies of Gabun—the country of du CHAILLU and of Mary KINGSLEY—being probably less known than those of any other part of Africa, the present is a welcome contribution to knowledge. Working to the west of the N'gounié River during the dry and part of the wet season of 1930, the author met with *G. palpalis*, *G. fusca*, *G. tabaniformis*, *G. pallicera* and *G. haningtoni*. Of each of the two latter, the occurrence of which in Gabun was previously unknown, only a single specimen was secured. Useful notes are furnished on haunts and habits, as affected by the dry and wet seasons. At the end of the rains, during sunshine, *G. tabaniformis*, previously regarded as

more especially a forest species, bit freely on the sea-shore at Mayumba. This species, like *G. palpalis*, which in the evening may be brought in by water-carriers, is attracted by artificial light, and both may enter native huts at night. The author, who displays familiarity with the observations of others, does not consider that the preference of tsetse-flies for a diet of human or animal blood can be deduced from the predominance of either sex in catches, or that the latter affords useful indications as to the presence or absence of preferred hosts, or the suitability or otherwise of haunts. *E. E. A.*

SWYNNERTON (C. F. M.). **Some Traps for Tsetse-Flies.**—*Bull. Entom. Res.* 1933. Mar. Vol. 24. Pt. 1. pp. 69–102. With 4 diagrams & 3 plates.

In local tsetse-fly control, traps seem destined to play a most important part, and much interest has recently been aroused by the enormous captures of *Glossina pallidipes* made by HARRIS in Zululand with a trap of his own devising. The matter however is not new, and in Tanganyika so long ago as 1922 Swynnerton used hide, hessian or cloth screens to attract tsetse-flies, which were then caught by hand with nets, or on bird-lime smeared on the screens.

Since the latter end of 1930, starting with a wire-gauze catching-cage placed on top of the screen, and keeping the attraction of the latter ever in view, Swynnerton has made and experimented with more than twenty forms of traps, of which an illustrated account, with full constructional details, is given in this paper. The traps were tested upon *Glossina palpalis*, *G. pallidipes*, *G. morsitans* and *G. swynnertoni*.

An effective trap is one containing a live calf, screened from actual attack by the flies ; a scent by which the animal may be replaced is now being sought for, and should this quest prove successful great results are anticipated. In the meantime most effective of all is a moving screen carried by expert fly-boys, who are able to catch with the net practically every fly that the screen attracts. *G. pallidipes* and *G. palpalis* can readily be caught by any suitable trap, but other species (*G. morsitans* and *G. swynnertoni*) are less responsive to the trapper's wiles. It is also noted that, whereas areas infested by *G. palpalis* are naturally restricted, the habitats of *G. morsitans*, *G. swynnertoni* and *G. pallidipes* are so extensive that these species can only be kept under by traps provided that all the flies can be reached, although attack be confined to limited spots.

Effective control by aid of traps is apparently feasible under certain conditions in the case of *G. pallidipes* ; in that of *G. palpalis*, if the infested river- or lakeside fringing thicket be first divided by clearings into lengths of manageable size, prospects are even better. The main *indirect* influences which affect trapping are meteorological ; trapping succeeds best when the evaporation rate is high.

A *G. morsitans* area is divisible into wooded " homes " of the fly, and feeding-grounds, which are more or less open spaces, with other characteristics. With minor modifications this applies also to the other species of tsetse. In a large fly-belt (the greatest length and breadth of the largest in Tanganyika are respectively 500 and 300 miles) it is obviously impracticable to cover the entire area closely with traps, and for this and other reasons the feeding-grounds are the best places in which to trap. Valuable notes are given on the

siting and setting of traps, which should be as conspicuous as possible; for successful trapping, knowledge of the habits of tsetse is essential. In order to test the "exterminative value" of trapping the four species of tsetse mentioned above, further experiments are to be made in three isolated areas, and the outcome of these will be eagerly awaited. Meanwhile no one concerned with the subject of tsetse control can afford to ignore this extremely valuable paper. *E. E. A.*

JUSSIANT. Contribution à la prophylaxie des trypanosomiases animales et humaines. [**Contribution to the Prophylaxis of Animal and Human Trypanosomiases.**]—*Bull. Méd. du Katanga.* 1933. Vol. 10. No. 1. pp. 8, 11–12, 14–15.

Glossina palpalis, which infests the fringing forest along all water-courses in the Lomami-Kasaï region of Belgian Congo, is the most important obstacle to the development of the local stock-raising industry. Precautions are taken to prevent stock from entering these fly-belts; artificial watering-places are provided, and where there is special liability to infection herds are driven to them after sunset, or at dawn. Besides measures of the usual kind against the fly, extensive use is made of the Harris trap, which is said to give excellent results. As the outcome of all this, the problem of stock-raising on the Lomami is said to have been solved. The Harris trap, manufactured locally, is now in regular use in the stock-raising area, and can equally well be employed for the protection of human communities. It functions best on cleared ground, fully exposed to the sun, three or four metres from the strip of forest along a stream.

E. E. A.

ADVIER (M.). Etude sur les puces de la région de Dakar. [**Fleas in Dakar.**]—*Bull. Soc. Path. Exot.* 1933. Mar. 8. Vol. 26. No. 3. pp. 452–454.

This is a survey of the fleas on rodents and in native houses in Dakar, extending over 12 months of the year and based on 43,592 identified parasites. *Xenopsylla cheopis* is the predominant flea of rodents (70 per cent.), *Echidnophaga gallinacea* coming next (24 per cent.). But among the fleas taken free in houses *Synosternus pallidus* is by far the most abundant (95 per cent.), *X. cheopis* being very rare. *S. pallidus* is primarily a parasite of man, and formed only 5 per cent. of the fleas on rats. *Pulex irritans* was not taken. *Ctenocephalus* occurred sparsely (about 2 per cent.) in both collections.

V. B. Wigglesworth.

GASCHEN (H.). Sur la présence de *Xenopsylla brasiliensis* et *Xenopsylla astia* sur les rongeurs domestiques de la région de Dakar. [*X. brasiliensis* **and** *X. astia* **in Domestic Rodents in the Dakar Region.**]—*Bull. Soc. Path. Exot.* 1933. Jan. 11. Vol. 26. No. 1. pp. 25–27.

The author has examined a number of fleas collected on rats in the Dakar region and sent to ROUBAUD by MATHIS & BAURY.

X. cheopis is in marked predominance, whereas in another part of Senegal, Tivaouane, it gives place to *Synosternus pallidus* [this *Bulletin*, Vol. 29, p. 154]. *X. brasiliensis* has not hitherto been reported from Senegal though it is known in Nigeria (CONNAL), and

in Freetown, Sierra Leone (BLACKLOCK & THOMSON, 1924) [*loc. cit.* Vol. 22, p. 297]. Of 720 fleas examined, the percentages were as follows :—

Xenopsylla cheopis	64·2
Echidnophaga gallinacea	17·5
Xenopsylla astia	12·2
Xenopsylla brasiliensis	5·5
Synosternus pallidus	0·3
Ctenocephalus felis and *canis*	0·3

A. G. B.

JAMESON (G. D.). **An Experiment to exterminate Bugs from Infested Buildings.**—*Jl. Roy. Army Med. Corps.* 1933. Feb. Vol. 60. No. 2. pp. 138–139.

An account of two experiments, one successful, to exterminate bugs in barracks at Gibraltar by means of ants ; the species was *Monomorium pharaonis* (?).

" The following points appear to be absolutely essential for success : (*a*) An entire nest complete with eggs, etc., must be obtained. This probably explains the failure of the second experiment. Both the colonies of ants used were collected by myself, and while (1) was apparently a complete nest and contained a large number of eggs, (2) was more in the nature of a collection of ants in earth and no eggs could be observed. (*b*) The ants' nest must be collected at the time of the year during which eggs are laid and hatched in large numbers. (*c*) Care must be taken that sources of food other than bugs are not available for the ants. Crumbs, etc., must be carefully removed after meals, and all stored food must be " ant-proof."

A. G. B.

HOEPPLI (R.) & FENG (L. C.). **Experimental Studies on Ticks.**—*Chinese Med. Jl.* 1933. Jan. Vol. 47. No. 1. pp. 29–43. With 4 coloured plates. [28 refs.]

This paper is in three parts : (i) deals with the skin lesions caused by natural infection with the ticks, *Hyalomma detritum*, *Argas pipistrellae*, *Ixodes* sp. and *Boophilus* sp. ; (ii) with the effects of extracts of ticks on blood coagulation ; and (iii) with the toxicity of emulsions of ticks injected into animals.

(i) Immediately round the mouth parts of the tick there is a homogeneous or necrotic zone probably due to a liquefying effect of the salivary secretion on the tissues. The surrounding corium shows perivascular infiltration with hyperaemia, oedema and haemorrhages. The cornified epithelium is thickened. The liquefaction of the tissues is regarded as merely incidental, and not as an essential process of extra-intestinal digestion such as occurs in many mites ; for the tick feeds on the blood itself.

(ii) The salivary glands of *Dermacentor sinicus* and *Hyalomma* contain a powerful anticoagulin.

(iii) Emulsions from the eggs of Dermacentor, Haemaphysalis and Hyalomma were very toxic when injected into dogs, rats, guineapigs, etc., but none of these animals showed symptoms of tick paralysis. Histologically they showed degeneration of the ganglion cells and myelin sheaths in the spinal cord, degenerative changes in the liver and in the kidney tubules and necrosis in the lymph follicles of the spleen.

V. B. Wigglesworth.

FUSS (S.) & HANSER (R.). Ueber Trombidiosis. [**Trombidiosis.**]—*Arch. Dermat. u. Syph.* 1933. Mar. 2. Vol. 167. No. 3. pp. 644–658. With 3 figs. (1 map.)

An account is here given of the biology and distribution in Germany of *Trombicula autumnalis*, the clinical and histological effects of the bites of this mite, and the diagnosis and treatment of the lesions it causes. The mites are curiously local in distribution, often being confined year after year to particular gardens for no apparent reason. In feeding they remain outside the skin and inject a secretion which causes necrosis of the epidermis, and induces a well marked inflammatory reaction with accumulation of leucocytes, transudation, hyperaemia and subcutaneous haemorrhage. The whole process is accompanied by intense itching and it follows the same course even if the mites are removed immediately after biting. The bites occur on the covered parts of the body, especially where the skin is pressed upon by elastic garters and such like. The most important part of treatment is prophylaxis, which consists in avoiding localities known to be infested. For the relief of the itching caused by the bites, the authors have found that the common domestic remedy of rubbing the part with soap is as good as any. *V. B. Wigglesworth.*

PAWLOWSKY (E. N.) & STEIN (A. K.). Ueber die Wirkung von *Dermanyssus gallinae* auf die Hautdecken des Menschen. [**The Effect of** *D. gallinae* **on the Human Skin.**]—*Ztschr. f. Parasitenk.* 1933. Feb. 16. Vol. 5. No. 2. pp. 421–424. With 2 figs.

The mites were confined in a petri dish secured to the forearm, and the lesions they produced were examined histologically. There was slight oedema and inflammatory infiltration of the dermis with dilatation of the capillaries, and there were defects in the stratum corneum. It is considered that the damage to the stratum corneum is produced mechanically by the chelicerae of the mites, but that the underlying inflammation is caused by the injection of saliva.

V. B. Wigglesworth.

AFRICA (Candido M.). **An Arthropod Associated with a Chronic Dermatitis involving the Face.**—*Philippine Jl. Sci.* 1933. Feb. Vol. 50. No. 2. pp. 205–209. With 2 plates.

Demodex folliculorum, which is said to occur in 50 per cent. of mankind, is generally considered as a harmless parasite ; but a case of long standing dermatitis due to this mite is here described. The condition arose in the margins of healed mustard gas lesions on the face and consisted of pinhead vesicular eruptions causing almost intolerable itching. Biopsy revealed the mites in the thickened horny layers of the skin, and the epithelium had proliferated and dipped into the stratum corium in many places. (Although this case showed no signs of malignancy, the author points out that such prolonged irritation might eventually lead to epithelioma.) The patient had been treated with every kind of dressing by many physicians for ten years without profit. Repeated freezing with the ethyl chloride spray proved very successful. *V. B. Wigglesworth.*

MORISHITA (Kaoru) & OMORI (Nanzaburo). **A Mite of the Genus** *Liponyssus* **found in Taihoku.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1933. Feb. Vol. 32. No. 2. (335). With 6 figs. on 1 plate. [In Japanese. English summary pp. 19–20.]

The authors discuss the mite found in Taihoku, Formosa, which attacks both rat and man and question whether it should be named *L. bacoti* or *L. nagayoi*. *A. G. B.*

BAEZA CUÉLLAR (Mariano). Estudio médico de los culicidos hematófagos.—pp. iv + 158. With 80 figs. 1933. Madrid: Talleres Gráficos Herrera, Hermosilla, Numero 44.

BISHOPP (F. C.). What Workers with Mosquitoes have Accomplished Around the World in 1930 and 1931.—Reprinted from *Proc. 19th Ann. Meeting New Jersey Mosquito Extermination Assoc. 1932. Feb. 17–19.* 20 pp.

BODE (H. G.). Schlusswort zu den vorstehenden Bemerkungen von Dr. HECHT.—*Dermat. Woch.* 1933. Apr. 29. Vol. 96. No. 17. pp. 590–591.

HECHT (Otto). Bemerkung zur Arbeit von H.-G. BODE: "Zur Kenntnis atypischer Mückenstichreaktionen (Culicosis bullosa)."—*Dermat. Woch.* 1933. Apr. 29. Vol. 96. No. 17. pp. 588–590.

MCKAY (W. J. Stewart). Facial Paralysis following Tick-Bite. [Correspondence.]—*Med. Jl. Australia.* 1933. Feb. 11. 20th Year. Vol. 1. No. 6. pp. 204–205.

MARTINI (Erich) & TEUBNER (Ernst). Stechmücken und Mikroklima.—Reprinted from *Forschungen u. Fortschritte.* 1932. Feb. 20. Vol. 8. No. 6. 2 pp.

PINTO (Cesar). Alguns mosquitos do Brasil e do oriente da Bolivia (Diptera. Culicidae).—*Rev. Med.-Cirug. do Brasil.* 1932. Oct. Vol. 40. No. 10. pp. 285–309. With 17 figs.

ROBINSON (William). The Use of Blowfly Maggots in the Treatment of Osteomyelitis and Certain Other Diseases.—*U.S. Dept. of Agric. Bureau of Entomology.* 1932. Mar. 1. 2 mimeographed pp.

ROBINSON (William). The Rearing of Blowflies and the Culture of Sterile Maggots for Use in Osteomyelitis.—*U.S. Dept. of Agric. Bureau of Entomology.* 1932. Mar. 9. 8 mimeographed pp. [12 refs.]

YELLOW FEVER.

MEASURES FOR THE PREVENTION AND CONTROL OF YELLOW FEVER EPIDEMICS IN FRENCH WEST AFRICA.

The administration in French West Africa has recently issued Regulations laying down special temporary and defensive measures for the prevention and control of yellow fever epidemics in the Territory[1] and with the Regulations a Circular Letter[2] making recommendations for the organization of investigation and prophylaxis to be established in areas which are susceptible to invasion or outbreaks of yellow fever, so that machinery will exist ready to combat and prevent the spread of the disease.

The circular letter points out that the experience of recent years has once again confirmed our scientific knowledge of the primordial rôle which is played by the native as the reservoir of the virus of yellow fever, in the causation of outbreaks of yellow fever and in the spread of this endemo-epidemic disease and of the *Stegomyia fasciata* or *Aëdes aegypti* as its intermediary or vector.

The development and the changes which have taken place in the social life of the native population and their movement beyond the formerly circumscribed areas of their villages which now freely takes place by the development of river, road and even sea traffic has had the effect of converting yellow fever into a veritable "disease of pathways" ("*maladie des sentiers*"), resulting in a further unknown quantity as regards the risks of contagion by this free circulation of the human reservoir of the virus in the form of carriers. There is, then, more than ever an urgent necessity for a methodic, permanent and vigilant campaign for the limiting of this menace by every possible means of information and action that can be brought into play. To this end each local civil administration in the Territory is asked to undertake a comprehensive and detailed inquiry among the chiefs of the cantons and of the villages, and generally among intelligent natives, into the following circumstances :—

(1) Has the disease known by Europeans as yellow fever been observed, and since when, in the village, canton, sub-division or area ?

(2) What is the name of the disease in the local language ?

(3) What are the age, sex and the occupation of the persons who are usually attacked ?

(4) Is there any special seasonal incidence of the disease ?

(5) Is there a regular rhythmic appearance each year, or does it appear irregularly ?

(6) By what symptoms does the disease manifest itself ?

(7) What is its duration ?

(8) Does it attack isolated individuals, or does it spread into the neighbourhood ?

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[1] (*b*) Arrêté portant réglementation des mesures d'ordre spécial, temporaire et défensif, destinées à prévenir ou à faire cesser les épidémies de typhus amaril en Afrique Occidentale Française. (*Journal Officiel de l'Afrique Occidentale Française* du 1er avril 1933.) See also Extract in *Bull. Office Internat. d'Hyg. publique*, 1933, vol. 25, pp. 745–753.

[2] I.—Afrique Occidentale Française).— (*a*) Circulaire du Gouverneur Géneral, du 23 mars 1933, concernant l'organisation de la campagne pré-amarile. (*Journal Officiel de l'Afrique Occidentale Française* du 1er avril 1933.) See also Extract in *Bull. Office Internat. d'Hyg. publique*, 1933, vol. 25, pp. 742–745.

(9) What is the approximate period of contagion ?

(10) What is the probable number of the sick, those who recover and those who die in relation to the total population ?

(11) Has a second attack ever been observed among those previously attacked ?

(12) What is the treatment given for this disease ?

Maps and, if necessary, graphs should be made from the information thus received so as to make the apparent incidence and extent of the disease, according to these natives' reports, as clear as possible. The health administration, for their part, should carry out a systematic scientific investigation with a view to eliminating the principal causes of error in the information collected by the administrative side by making a more scientific diagnosis by means, for example, of serum tests and by collaborating with the administrative side with a view to expediting the despatch to the laboratory of the blood samples, etc., taken. The chiefs of cantons and the headmen of villages should be instructed in the great importance of sending an immediate report to the administrator of all suspected sickness and death from yellow fever with the object of obtaining prompt medical assistance as regards treatment and expert advice on the immediate measures for prevention of the spread of the disease.

The covering note concludes with an outline of a sanitary organization for the control of insect vectors, for the improvement of the sanitary state of villages and for the close supervision of sick natives with a view to discovering early and abortive cases of yellow fever. Mobile sanitary units are to be established, comprising the following equipment :—

A microscope with slides, stains, etc. ; equipment for taking blood samples ; collapsible mosquito proof chambers ; mosquito netting ; boots and gloves for the protection of the personnel ; overalls and rubber gloves for the Medical Officers ; postmortem outfit ; flasks for the preservation and despatch of histological material ; hand sprays ; liquid insecticide ; fixing agent ; an abundant supply of sulphur and two large tarpaulins, such as are used by railway companies.

The whole of this equipment should be so prepared that it can easily and rapidly be packed on a motor lorry or truck for immediate despatch to a distant area. The use of this outfit implies, if it is going to be of any value, the formation of a team of hygienists, which should include a specially trained European Medical Officer. Besides this there should be established, within approximately ½ mile of each important agglomeration of population and especially close to highway crossings, a sanitary station for the isolation, observation and segregation of cases. Existing accommodation should be used or else improvised mosquito proof installations capable of rapid erection. There should be an organized scheme for making use of the native element as an aid to the organization and maintenance of these local installations. This can best be done by health teaching among selected members of the population by means of talks, tracts, posters, notices, etc., adapted to the limitations of the various mentalities.

The regulations prescribe, in considerable detail, special temporary and defensive measures to be carried out for the prevention and control of epidemics of yellow fever which threaten or exist. These special measures are ancillary or supplementary to standing instructions which have been previously issued in the form of local Orders by the Lieutenant-Governors of colonies and by the Administrator of

the Dakar area. The new Regulations are divided into three parts depending on the conditions which exist in the area :—

(1) A régime to be followed when the public health is in imminent danger by reason of the existence of yellow fever in the neighbouring regions or on account of the past history of the area, or temporarily during certain seasons or when movements of population take place. In such circumstances any case with signs of fever must be immediately isolated under mosquito netting until the sick person has been visited by a doctor or, failing that, for the first five days of the sickness. Such cases must be at once reported by the chiefs of the villages, native headmen, etc., to the medical authority as well as any deaths which are occurring among the population. The health service will then undertake regular domiciliary visits, with as little delay as possible, with a view to confirming the reports and to ascertaining any undiscovered cases of fever and placing them under control.

Any suspected case which responds to the " prophylactic diagnosis," as defined by the African Conference on Yellow Fever of 1928, must be notified to the administrative authority either by the Medical Officer or by the sick person himself or by his relatives, etc. Persons of European stock may not móve freely about in areas, to be defined by the administration, where suspected cases have been discovered among the native population, and in any event any movement permitted must be subject to the possession of a satisfactory sanitary passport. In the case of a man moving from one area to another, he will be required to present himself daily for medical examination for a period of six days from the date of his leaving the area, and in no event will a man be allowed to enter a " danger zone," even if he comes from an uninfected area, unless his sanitary passport shows that at the time of his departure there were no symptoms of febrile disease.

(2) A régime of " sanitary supervision " is to be applied when one or more proved cases of yellow fever appear in a town or in a circumscribed area without necessarily constituting a focus of infection.

Proof is taken to mean a case in which the diagnosis on clinical evidence is confirmed and controlled, whenever possible, by a microscopic examination. Should the patient survive, a systematic examination should be undertaken by the Pasteur Institute at Dakar by means of samples of blood, in order to confirm the original diagnosis and then by protection tests in order to ascertain the extent of the infection in the area concerned. A strict notification of cases must be sent to the administrative authorities without delay and similar notifications will be forwarded to neighbouring colonies. Direct relations should then be established between the authorities of the infected colony and neighbouring colonies in order that suitable measures may be taken to protect the latter from the spread of the disease into their territory.

As far as the infected area is concerned, all cafés, restaurants, dance halls, cinemas, shops, etc., shall close at 9 p.m. and any such places in the near neighbourhood of a case of yellow fever shall be asked to close their establishments from 5.30 p.m. to 6.30 a.m. for the time being.

All persons resident in the area placed under supervision must protect themselves at night by mosquito netting either in a room, building or under a net, in such a way that protection is efficacious. The same conditions as to movement and the provision of a sanitary

passport, as laid down in the previous paragraph, apply here but more strictly.

(3) A system of "sanitary observation" is to be applied, in any town or area, when several cases of yellow fever occur, in such a way as to constitute or to threaten to become a focus of infection. A "focus" is here defined as existing when the occurrence of new cases outside the immediate surroundings of the first cases proves that the spread of the disease has not been limited to the place where it began. Stricter regulations are laid down in regard to the employment of workers in workshops and to the opening of public places during the evening hours and the night. All meetings are forbidden, and as regards movements no one may leave the infected area unless furnished with a sanitary passport certifying that he shows no febrile symptoms and that his effects have been disinsected and that he has passed the six preceding nights in a mosquito-proof dwelling which is under the control of the medical authority or in an approved observation station.

All persons coming from non-infected regions and crossing the contaminated zone during a period of less than six days may be granted a sanitary passport if, from the time of his arrival to the time of his departure, he has been isolated each night under the conditions referred to above.

Trucks, waggons and all vehicles for the transport of travellers and merchandise must be disinsected before leaving the contaminated zone and the compartments of the train occupied by individuals must be effectively mosquito-proofed. It is forbidden to export from the infected area merchandise capable of harbouring mosquitoes, unless it has been disinsected in the prescribed manner, such as empty bottles, straw packages and similar receptacles, and all products containing sugar, whether fresh or dried, loaded loose or packed in crates.

Finally, all the above measures are applicable and will be vigorously applied to aircraft (personnel, passengers, material and baggage). Consequently any aircraft leaving a zone coming within one of the three above-mentioned régimes will undergo before its departure the measures in force in that zone and, furthermore, will be boarded on its arrival at aerodromes of transit and destination. In a case of accidental landing boarding will be carried out by the nearest Medical Officer.

Permanent Commissions for Sanitary Control will be established by the local authorities in areas coming under one of the three régimes whose mission will be to control the execution of the protective measures laid down and to verify the facts, making a report thereon the same day. These reports can be used, if necessary, for immediate judicial procedure. *M. T. Morgan.*

MISCELLANEOUS.

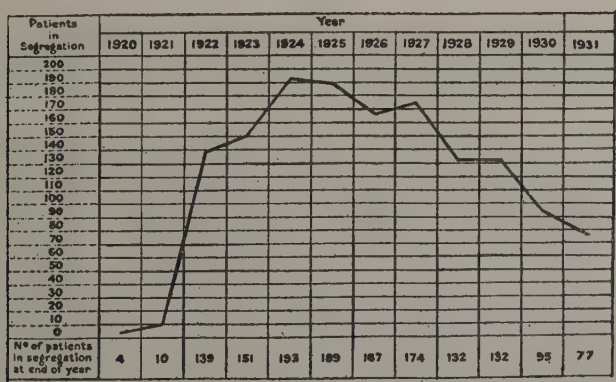
GRANT (Alan M. B.). **A Medical Survey of the Island of Nauru.**—*Med. Jl. Australia.* 1933. Jan. 28. Vol. 1. No. 4. pp. 113–118. With 2 figs. & 2 graphs. [15 refs.]

Nauru or Pleasant Island was annexed by Germany in 1888 and since 1920 has been governed by the Commonwealth of Australia under mandate. It is just south of the Equator at 167° E., lying west of the Gilbert Islands; its circumference is 11 miles. This little coral island is inhabited by 1,500 Nauruans, 140 Europeans and some 900 Chinese. The account here concerns the Nauruans. The topography and climate are described; the average rainfall is 85 inches.

Filariasis.—The blood of 354 Nauruans was examined, fresh and stained, night and day, for microfilaria; 36·1 per cent. of night bloods were positive and of 25 of these examined at mid-day all were negative. The embryos were identified, by comparison with stained specimens, with *Mf. bancrofti.* We are reminded that in Fiji this worm is non-periodic. Twenty-five persons were found to have elephantiasis, in all but one affecting the scrotum or legs. Crushed specimens of *Culex fatigans* showed living filarial embryos. Purulent myositis is not rare; there seems no explanation, says the author, other than filariasis.

There are no anophelines and consequently no endemic *malaria.* The mosquitoes present are listed as *Culex fatigans, Culex quinquefasciatus, Stegomyia fasciata, Aëdes argenteus* [clearly two sets of brackets have been improved away by the printer].

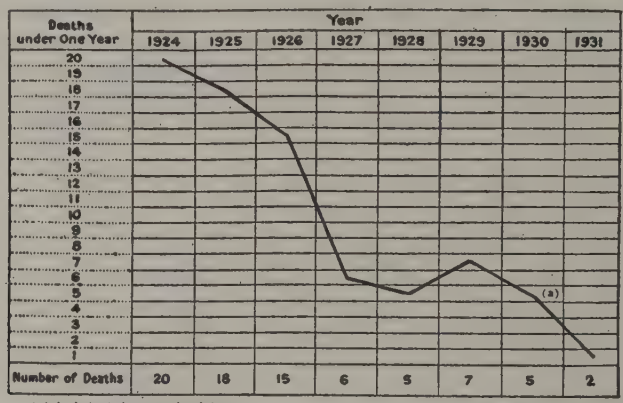
Leprosy was introduced in 1920, spread rapidly, and by prompt measures was brought under control [see this *Bulletin,* Vol. 27, p. 997]. Every six weeks every Nauruan is examined for signs of leprosy. The graph shows the rapid increase and gradual decline.



Graph showing incidence of leprosy (number of patients in segregation) on the Island of Nauru from 1920 to 1931.

Hookworm.—Eighty stools were examined; none showed worms or hookworm ova. "The methods used were diagnosis by vermifuge, plus diagnosis by Barber's glycerine-saturated salt method."

Baby clinics have been established in five of the native districts and babies up to 2 years of age are weighed weekly. BRAY's mixture of yeast from toddy and cod liver oil is administered [*loc. cit.* Vol. 25, p. 869]. The graph shows the course of the infant mortality; the check in the descent of the curve is put down to temporary disuse of the emulsion. The average number of births per year is 60; the maternal mortality for the last five years has been nil.



Graph showing infantile mortality on the Island of Nauru. [Note how the fall in mortality was checked in 1929 when the use of Bray's emulsion was suspended.]

[Reproduced from the *Medical Journal of Australia*.]

Of the 25 Nauruan deaths per annum 14 of 24 in 1931 were due to *tuberculosis*.

Fourteen natives have paralysis due to an epidemic of poliomyelitis in 1910. *A. G. B.*

KIRK (J. Balfour) & ANDRÉ (J. Hermann). **Medical and Sanitary Notes on Rodrigues.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1933. Mar. 23. Vol. 26. No. 5. pp. 449–466. With 1 map.

Rodrigues is a dependency of Mauritius, lying 350 miles to the eastward. It is hilly and has an area of 42 square miles. The authors visited it on separate occasions and spent in all 15 days there. The average temperature is 76·9°F. and the rainfall 44·5 inches. The population has grown from 200 in 1825 to 3,162 in 1901 and 8,202 in 1931. The great increase is due to immigration from Mauritius as well as natural increment. The people are Africans with an appreciable European mixture and form two distinct racial groups. Their physique is much superior to that of the Mauritians, which may be due to the absence of malaria or the different diet. The Rodriguean lives on his own produce with maize as staple, the Mauritian on imported rice. Details are given of the language, habits and clothing, occupation, dietary, housing and villages, communications and administration. It is a relatively isolated community. Sanitation is primitive but there are no outbreaks of water-borne disease.

Communicable diseases.—A hookworm survey was made by G. G. HAMPTON in 1922. His table, reproduced, shows that of 393 persons,

from every part of the island, examined 123 or 31 per cent. were positive for ova. No special part of the bush is reserved for defaecation, so that the chance of reinfection is not great. Hookworm disease has not yet manifested itself. In 39 stained films of faeces *E. histolytica, E. coli, Giardia lamblia, Endolimax nana* and *Chilomastix mesnili* were identified at the Mauritius laboratory. Kirk examined 84 evening bloods for microfilaria; all were negative.

Leprosy was introduced by one Diango from Mauritius between 1870 and 1880. In 1920 Dr. MANGENIE recognized 23 lepers, descendants of the first family affected or of Diango and in 1926 46 lepers had been discovered. In 1930 André, as a specialist officer, visited the island. He spent 6 days examining all known cases and 580 school children all of whom were free from the disease. A table is given of the 20 cases examined by André. The authors write :—

"The general outlook as regards this disease is by no means alarming : it is almost reassuring. The tendency of the Rodriguean to prefer his own hut, the difficulty of communications, the freedom from intercurrent disease, the general health of the people and their interest in the disease all tend to operate in favour of its disappearance at no very distant date."

Tuberculosis incidence was tested by the intradermal injection in the skin of the forearm of a dilution of Koch's old tuberculin, the same material and method as was used by Peter ALLAN in the Transkei Territories [see *Bulletin of Hygiene*, Vol. 7, p. 596]. The results in the 655 persons tested are recorded in four tables. The numbers, which are small, give the unexpected result of a lower percentage of positive reactions in Eurafricans than in Africans. The authors conclude that Rodrigues cannot be regarded as severely tuberculized, and that the outlook is not bad.

Malaria in the absence of Anopheles is unknown. The distance from the shore at which ocean going steamers must anchor, and the generally prevailing wind are good barriers against anopheline importation. [MACGREGOR (1924) strongly condemned a proposal, for the avoidance of lighterage, to build a jetty from Port Mathurin to the edge of the coral reef.]

The vital statistics of the island for 1929–31 show a death rate of 13 to 15, and a birth rate of 40 to 47. The infant mortality rate, except in 1931, is below 100. *A. G. B.*

LATHAM (D. V.). **The White Man in East Africa.**—*East African Med. Jl.* 1933. Jan. Vol. 9. No. 10. pp. 276–282.

This article deals partly with physiological changes at high altitudes and partly with practical problems in East Africa such as the management of pregnancy and the white child.

The author is concerned with the white population at 4,500 feet and over. He notes that whereas the tropical ailments diminish with altitude the psychological changes increase as atmospheric pressure diminishes. It is the combination of proximity to the equator and altitude which gives the East African highlands their special character. He considers mountain sickness, the pulse-rate, anoxaemia, noting the fact that the death rate from pneumonia at the South African mines at 6,000 feet is much higher than at sea level, effect of high altitude on the mental faculties in reference to neurasthenia [but is this any less common at sea level ?], increase of red corpuscles with altitude, recording that in a Kilimanjaro ascent in 1926 he found

the red cells as numerous at 11,500 feet as they were in the Everest climbers at 15,600.

In regard to the white women he finds it hard to predict the date of confinement, drug induction is rarely successful and he holds that an attack of malaria in the pregnant woman is far more dangerous than over-large doses of quinine. He notes the frequency of post-partum retroversion of the uterus and its curability in its early stages. He thinks post-partum haemorrhage is more common than in England. He discusses the feeding and management of the baby. Finally he expresses the opinion :—

" It is doubtful if a community will ever be able to overcome the added trials of the sun and the altitude in a country where communications are rapidly improving and the strain of a competitive life is daily approaching that found in more temperate climates." *A. G. B.*

BLACK (Kenneth). **Health and Climate with Special Reference to Malaya.**—*Malayan Med. Jl.* 1932. Dec. Vol. 7. No. 4. pp. 99–107. With 1 folding map. [11 refs.]

The author opens with a discussion of HUNTINGTON's findings* and reproduces that author's map of the distribution of human health and energy on the basis of climate [see this *Bulletin*, Vol. 17, p. 345]. From such a map he thinks governments and commercial firms can tell with some degree of accuracy the differences between the various countries from the point of view of physical and mental energy combined with physical and mental good health. Terms of leave are then considered and it is noted that compared with Tropical Africa and the Sudan the leave terms of Ceylon and Malaya are poor, furlough being granted at intervals of 3–5 years. It is the accepted view, the author believes, that physical and mental deterioration take place in all tropical countries and he discusses these forms of deterioration in turn.

As an instance of the former he states that whereas in England presbyopia becomes manifest at about 45 years, in tropical races it occurs at about 35, and ophthalmologists in the East find that in Europeans long resident there it comes on sometimes as early as 38. The same is true he states of senile cataract. On mental deterioration he cites the experience of the Dutch East Indies. In 13 consecutive years (1919–1931) of the total number of European Government Officials sent on sick leave to Europe the average proportion of those suffering from neuroses and psychoses (army and navy excluded) was 50 per cent. Suicide, again, which occurs in England at the rate of 110 per million (1929), in Singapore Europeans in the last eight years has averaged 233. Mr. F. G. BOURNE, the Singapore coroner, places sex and alcohol low among the causes.

In the author's experience missionaries in Malaya rarely get " nerves " though they stay out for years and often for life, and he suggests that the man whose life is full, who has many and varied hobbies and interests is better able to face the disappointments of life. He refers to the value of hill stations and the cooling of rooms. Bedrooms should have cubicles fitted with electric refrigerators, ensuring sleep at a low temperature. Returning to the leave question he expresses the opinion that the maximum tour in Malaya should never exceed three years without a vacation in Europe ; efficiency, mental equilibrium and alertness will thus be preserved.

* In " Civilization and Climate."—Oxf. Univ. Press.

[Missionaries have not always been so free from "nerves." G. Basil PRICE in 1913 showed that of 203 invalided from India the cause in 20·6 per cent. was "nervous conditions of a neurasthenic type," of 203 from China neurasthenia accounted for 25 per cent., and of 134 from Africa 20·8 per cent. (*Brit. Med. Jl.* 1913, Vol. 2, p. 1290).]

A. G. B.

CHAMBERLAIN (Weston P.). **The Medical Activities of the Panama Canal.**—*Milit. Surgeon.* 1933. Feb. Vol. 72. No. 2. pp. 108–124. With 1 chart & 2 figs.

The great object-lesson, the sanitation of the Panama Canal, has frequently figured in this *Bulletin*, *e.g.*, Vol. 25, p. 910, and Vol. 28, p. 770, the last article being similar to that now under review. Here we concentrate on the prevention of malaria which after all is *the* problem of most tropical countries. Colonel Chamberlain writes :—

"To free the entire Canal zone from malaria would be prohibitively expensive and no attempt has ever been made to accomplish such freedom. Our anti-malaria efforts are confined to the *vicinity of the more important towns, within which nearly all of the employee population is concentrated.* (Italics in original.) Residents of the Canal Zone not connected with the Government, such as native farmers, are required to live at least one mile beyond the borders of the sanitated towns."

He goes on to point out that the methods of attack on malaria have changed as time went on :—

"Clearing away grass and jungle as a health measure was wisely abandoned about 12 years ago ; it is now well known that shade provided by vegetation prevents the breeding of some dangerous species of anopheles and that removal of vegetation will often result in the development of malaria-carrying mosquitoes in pools or streams where only harmless ones had bred before. Larvicides are employed to a less extent each year and their use is now mainly confined to *bodies of water which cannot be obliterated.* Fuel oil has replaced other chemical agents because of its cheapness, its ease of application, and its effectiveness against *all* species. Paris green is used to a limited extent in a few areas. Preliminary treatment of every malaria case *in hospital*, together with *prolonged compulsory after-treatment* is insisted on for the protection of both the patient and the public.

"Under the more stable conditions existing since completion of the Canal in 1914, increasing emphasis has been laid upon the *final obliteration of mosquito-breeding areas by means of permanent drainage.* . . .

"In all of the more recent drainage programs carried out by the Health Department of the Panama Canal the first step has been to map out each main line or lateral and then to plot the gradients on cross-section paper after survey of the terrain with a wye-level. These two procedures are for the purpose of obtaining the best available flow throughout the entire system, and such preliminary study is especially important when the land to be drained is nearly flat. Wherever conditions are suitable, the installation of rock-covered subsoil tile pipe is the method of choice for permanently drying up a breeding area. A grade of at least four feet in a thousand is essential for proper operation of a tile system. The tiles used are one foot in length, either six or eight inches in diameter, and are made of concrete in the Health Department Tile Plant. They are placed loosely end to end in a narrow trench about two feet deep, which is then filled with broken rock. Tiles laid in this manner rarely become obstructed by roots or silt, even after many years, and practically no upkeep is necessary.

"Concrete-bottomed open drains are made by installing in the bottom of an earth ditch a series of precast concave sections or inverts laid accurately to grade. These inverts are manufactured in the Health Department

Tile Plant, being three feet long with a hemi-cylindrical channel fourteen inches across; they have interlocking male and female ends. As compared with a simple earth ditch the concrete-bottomed drain takes off the water more rapidly and completely, is easier to clean, and is less expensive to maintain. It operates satisfactorily on terrain where the grade is too flat for the use of subsoil tile. . . .

"Permanent drainage works represent a considerable capital investment, but are economical in the long run because the upkeep is much less than is the case when simple earth ditches or larvicides are relied upon. Furthermore, the probability of complete mosquito control is greatly enhanced when permanent drains have been installed."

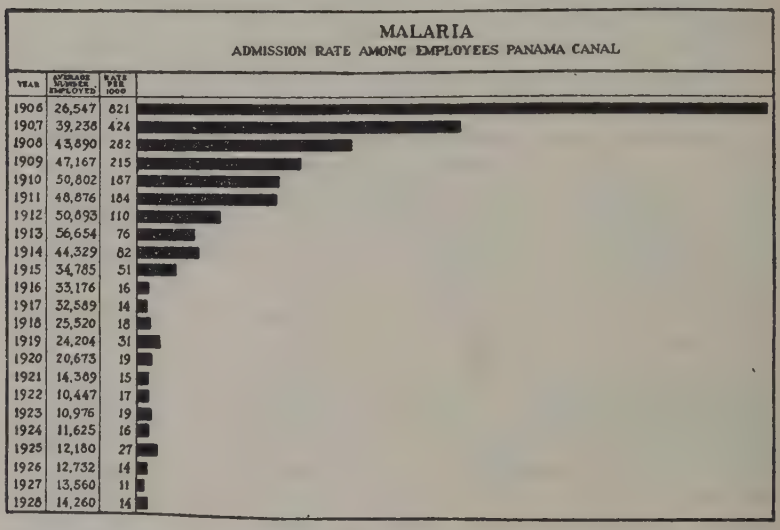


Chart showing reduction in admission rates from Malaria among employees of the Panama Canal and Panama Railroad between 1906 and 1928.

[Reproduced from *The Military Surgeon.*]

During the period 1926–1928 approximately 110,000 dollars (£22,000 at par) per year were spent on anti-mosquito work for the prevention of malaria, a large part for permanent or semi-permanent drainage systems. The chart shows the reduction in malaria. *A. G. B.*

WAR OFFICE. **Report on the Health of the Army for the Year 1931** [FAWCUS (H. B.), Director-General, Army Medical Services].—pp. iv + 158. With 5 charts. 1933. London: H.M.S.O. [2s. 6d.]

This is an informative report. The following account is restricted to the health of the army abroad and chiefly in India (pp. 89–126).

India.—The average strength was 2,319 officers and 55,842 other ranks. The principal causes of sickness in officers were, in order of prevalence, malaria, sandfly fever, inflammation of areolar tissue, dysentery, tonsillitis, diarrhoea, influenza. In soldiers malaria easily heads the list with 6,282, followed by other diseases in almost the same order, except that gonorrhoea comes fifth. An increase of 2,250 admissions was chiefly due to a mild type of influenza (1,560

cases). There were 160 deaths or 2·87 per mille. The chief causes of invaliding were, inflammation of middle ear, pulmonary tuberculosis, epilepsy and dementia praecox.

Principal Diseases—*Dengue and sand-fly fever.*

Sand-fly fever is a disease of the comparatively hot and arid areas of the North-West Frontier and Northern Punjab and shows a tendency to occur in two waves, April–May and July–August; the second wave may be due to the return of susceptible persons from the hills. A mean 8.0 a.m. temperature between 70° and 90° is associated with increased incidence of the disease; rainfall and relative humidity show no such correlation. Difficulty of diagnosis complicates such a study, confusion with influenza and malaria being easy. "No really effective methods of prevention have been devised."

Pyrexia of Uncertain Origin.—202 cases were reported. They were classified as "long" and "short." The "short" fevers presented no symptom or sign on which a classification could be based. The "long" fevers were carefully studied and all possible tests were made. The only fact ascertained was that a certain proportion are intestinal in origin.

Enteric fevers.—Of 493 cases occurring among British and Indian troops 254 or just over half were diagnosed by isolation of the specific organism; the remainder were classified as "enteric group." A table shows that 80 per cent. were diagnosed by blood culture, 25 per cent. would have been diagnosed by faeces culture alone and 7·5 per cent. by urine culture alone. Of the 195 positive blood cultures 153 were diagnosed on the first culture and 36 on the second. Faeces culture was disappointing. It is noted that enteric fever in epidemic form has almost ceased to exist; with the exception of 4 outbreaks of 10 cases or less, all were sporadic and acquired from contact with civilian sources of infection. Of officers 94·5 per cent. were protected by inoculation, and of other ranks 98·7 per cent.

Among the protected there were 2·8 per cent. of cases and 0·2 per cent. of deaths;

among the unprotected 10·5 per cent. of cases and 0·59 per cent of deaths.

This from an average of the two half-yearly returns.

Dysentery, diarrhoea and hepatitis.—The rate per mille for dysentery, diarrhoea, colitis and hepatitis + liver abscess was 28·5, 15·4, 0·3 and 1·5. The following is an analysis of the types of dysentery found in the 1,593 cases occurring among British troops:—

	Number.	Per cent.	
Protozoal (*E. histolytica*)	189	11·9	
Bacteriologically proven	638	40	64·05
Bacillary exudate (no dysentery bacilli isolated)	383	24·05	
Clinical	383	24·05	

Figures are given for the several types of bacillary dysentery. Polyvalent high potency (double strength) antidysenteric serum "Hoechst" has been very favourably reported on for treatment and arrangements have been made to maintain a stock of this serum. One death from dysentery occurred. The examination on enlistment of cooks, waiters, water-carriers, bakers and dairymen continued. Dysentery bacilli were isolated from 64 persons and *E. histolytica* cysts from 460, a carrier percentage for the latter of 3·15. In most cases the season of greatest incidence was the fly season; in others

dust was suspected. Of hepatitis 71 cases were regarded as amoebic in origin and all responded readily to emetine; in 11·3 per cent., however, there was a history of previous hepatitis, indicating the necessity for more thorough treatment.

Malaria.—The incidence varied from 140·8 per mille in the Western Command to 66 in the Burma District; for all India it was 112 per mille. The varieties when a microscopical diagnosis was made (fresh cases) were 2,470 B.T., 849 M.T., 28 B.T. + M.T. and 17 Quartan. Of 6,282 cases only 466 were diagnosed as clinical malaria, *i.e.*, were incompletely diagnosed. An outbreak of 25 fresh cases occurred in Wellington, a hill-station hitherto considered free; *A. maculipalpis* is believed to be the carrier. An investigation showed that the amount of missed malaria cannot exceed 1 per cent. of the total admissions. A study of albuminuria in hospital cases showed that this symptom is due to the febrile condition and not to the quinine, and that it is transient and of no clinical importance.

An attempt was made to determine the minimum effective dose of plasmoquine. In Poona 325 cases were treated with 0·03 gm. for 10 days, followed by 0·02 gm. for 11 days, plus 20 grains of quinine daily; the relapse rate was 2·8 per cent. A few cases were successfully treated with atebrine.

There is matter of interest under antimalarial measures which does not lend itself to summary. The measures include treatment of the sick in neighbouring villages and village antimalaria gangs (at Kohat), a weekly "dry day" for all artificial collections of water, varying treatment of nullahs according as they maintain a continual flow of water or are dry except after rain. Fumigation has been abandoned. Spraying is resorted to in exceptional circumstances; the factors to be considered are the rate at which barrack rooms become reinfested with mosquitoes, whether the mosquitoes remain in the room after biting, the mosquito population of the room in the day time, the possibility of dealing with breeding places, the extent to which infection takes place outside barracks. Two sets of experiments were carried out on the efficiency of various insecticide sprays with results which are tabulated.

Ophthalmology.—The controlled enlistment of trachomatous recruits into the Indian army has developed into an investigation into the nature and extent of the disease in northern India. It was found that over 90 per cent. of Sikhs are infected, that infection starts in childhood and progresses as a rule to a quiescent stage which produces little disability, and that there is no evidence that the disease is so infectious as to make these men dangerous either to their fellows or to British units. 621 trachoma recruits were enlisted in the year.

A. G. B.

MOUCHET (R.). **Medical Assistance to Natives, with Special Reference to the Belgian Congo.**—*East African Med. Jl.* formerly *Kenya & East African Med. Jl.* 1932. Dec. Vol. 9. No. 9. pp. 246–257.

An interesting address on this important problem which, as the author says, cannot be solved by the medical department alone. We give one extract:—

"A quite recent experiment was begun on July 1st, 1931. Over the space of half the district of the Lower Congo (about 3 sq. degrees, 14,500 square miles), 10 doctors, 11 sanitary auxiliaries in the Government service,

helped by four doctors from religious missions, and 26 missionaries both Catholic and Protestant, were sent out to the villages. One hundred and ten native attendants are under their orders. The whole of this staff is in addition to the number of doctors existing in the centres, to which, moreover, the surgical cases are eventually sent.

"355,855 natives have been examined, and 200,000 patients treated, including 23,232 for yaws, 242 for syphilis, and 12,182 for ulcers.

"Since the 1st of July this organization has been spread over the whole of the district of the Lower Congo, with an effective of 16 doctors, 17 sanitary auxiliaries of the State, without counting the missionaries.

"This plan, which constitutes the maximum of assistance to the natives, is perhaps slightly premature. However, it will be most interesting to see the result of this vast experiment.

"From the experience gained, we can establish with certainty the necessity in the tropics of establishing a system of social medical work, which, without neglecting the interests of each individual patient, yet first bears in mind the interests of the community." *A. G. B.*

AIRD (Robert). **Notes on Tropical Diseases sometimes seen in Home Practice.**—*Glasgow Med. Jl.* 1932. Oct. Vol. 118. No. 4. & 1933. Mar. Vol. 119. No. 3. pp. 254–265; 82–86.

A didactic article for the general practitioner at home. The diseases described are malaria, kala azar, amoebic dysentery, bacillary dysentery, sprue, trypanosomiasis, undulant fever and helminthiasis, especially schistosomiasis. The author's experience was acquired at Hankow. *A. G. B.*

HARLEY (G. W.). **Ganta Dispensary Patients. A Statistical Study of 6,291 Consecutive Out-Patients in Northeastern Liberia.**—*Amer. Jl. Trop. Med.* 1933. Jan. Vol. 13. No. 1. pp. 67–96. With 2 figs.

An account of dispensary work at a pioneer mission station in North Eastern Liberia during 3½ years, with 14 tables.

A charge of one shilling was made for treatment; this may be regarded as a primitive health insurance because it covered treatment, if need be, for three years. Leprosy alone was treated gratis. The group includes few children and almost no infants, and also few old people. The reputation which Ganta acquired for the cure of yaws served to concentrate cases of the disease from a wide area. A table of age and sex distribution shows that the sexes were approximately equal and half the patients between 20 and 40 years. An elaborate table gives the complaints and the patients' own diagnoses for each sex in the several decades; "general bone pains" was by far the commonest complaint, followed by "sores" and "headache." It is stated that the native has considerable appreciation of disease entities and that in the group of 138 lepers all but two had correctly diagnosed their condition. Another interesting point is that, yaws in the granuloma stage being known as *kala*, to the names for crab yaws, juxta articular nodules, ichthyotic conditions of the hands, and a type of leucoderma the word *kala* was prefixed, evidence in the author's opinion that all these are recognized as phases of the same disease. Other tables show the complaints arranged in order of frequency. The commonest complaints, those of general pains, sores and headache are relieved by bismuth, suggesting a spirochaetal origin. The complaints are discussed. Dysuria, which comes high, was often cleared up by intravenous antimony tartrate.

Except for occasional microscopic examinations diagnoses were made on clinical grounds. Three tables deal with these. "Treponematosis" was diagnosed in 5,598 instances out of 8,003 diagnoses, 89 per cent. of cases; the great bulk of it yaws. Other entries are intestinal parasites (not often looked for) 411, schistosomiasis 248, hernia 170, leprosy 142, crab yaws 137, gonorrhoea 112, secondary yaws 110; and, below this line, gangosa 78, ulcerating granuloma 77, goundou 44, tropical ulcer [very low] 34, elephantiasis 30, interstitial keratitis 25, trypanosomiasis 12. Another table, which is of some interest, arranges the diagnoses according to age incidence. A summary of stool examinations gives 117 cases of *Schistosoma mansoni* infection, 24·6 per cent. of those examined who complained of abdominal pain. The total of hernias, 582 [which however includes 18 hydroceles] is 9·24 per cent. of the whole series. Another table gives the tumours met with. A figure shows the ratio of males to females in the various diseases. The chief diseases of male preponderance are ulcerating granuloma, trauma, heart failure, central nervous system treponematosis. The conditions incident chiefly on females are—schistosomiasis, goitre, keloid and intestinal parasites: the first is explained by the habit of the women of standing in the water washing clothes.

A. G. B.

MacArthur (W. P.). **The Teaching of Tropical Medicine.**—*Brit. Med. Jl.* 1933. Jan. 28. pp. 156–157.

We make two extracts from this valuable address:—

"It has long been my belief that the standard of knowledge in general medicine is lower to-day than it was when I qualified. Some time ago I had an experience which confirmed this impression. It fell to my lot to examine a number of recently qualified medical men representing many of the teaching schools. Having a clear recollection of the examination in clinical pathology which I and my fellows had passed in order to qualify, I subjected this group of men to an identical test, and of over a dozen only two came up to the standard which was expected, and obtained, in my time. The lack of knowledge shown by some was deplorable . . . a considerable number of those commencing a course in tropical medicine literally do not know how to use a microscope, and ought to be excluded by imposing a simple preliminary test, if monetary and other considerations permitted."

"In the teaching of parasitology, the course should be restricted to essentials, for the time allotted is necessarily short, and those undergoing instruction tend to be overwhelmed with masses of information new to them, and so fail to sift out and grasp the points of basic importance. It is absurd to expect a class to know the characters of, say, one of the less common intestinal flagellates when they can still be shaken in their identification of a malaria parasite. I remember one examination candidate who himself introduced a discussion on the ova of some of the rarer helminths of man, on which he discoursed with unction. Then, being given a microscope and a faeces preparation, he carefully selected a bit of vegetable débris and identified it as an egg of, I think, *Trichostrongylus colubriformis*. That is tropical medicine upside down." *A. G. B.*

Bombay. **Report of the Haffkine Institute for the Year 1931** [Taylor (J.), Director].—72 pp. With 1 chart. 1933. Bombay: Govt. Central Press.

The report deals in the usual way with the routine and research activities of the staff. Scorpion venoms formed a special subject of

study. These venoms are very complex and consist of neurotoxins, haemolytic and leucolytic substances, coagulants, lecithin, cholesterin, a cardiac tonic and a vascular tonic. They resemble snake venoms closely. Much work has been done on a biological method for the standardization of antiplague vaccine in which white mice are the animals used. Five animals, over 3 months old and weighing between 20 and 30 gm., are used for each dose of the test vaccine. The minimum dose required to protect against 0·5 cc. 1–500,000 dilution of a 48-hr. broth culture of a strain of *Past. pestis* of known and maintained virulence, grown at 27°C., is taken as the measure of potency of the vaccine. This test dose contains about 100 organisms and is injected 10 days after the protecting vaccine. It is interesting to find that one brew of the Bombay vaccine and one of the Lister Institute vaccine protected in a dose of 0·007 cc., whereas the other vaccines tested required a dose of 0·1 to 1 cc. or more. Every brew of the Bombay plague vaccine has given complete protection with a dose of 0·03 cc. per animal. This biological method of testing, of which fuller details are given, is also being used to test the immunity of rats from different towns in India. The marked difference between Bombay and Madras rats has long been known. Another piece of research has been the establishment of an easy means of differentiating *Past. pestis* from *Past. pseudotuberculosis rodentium.* A 1 mm. loopful of a broth culture of plague is diluted in about 10 cc. normal salt solution. When 1 mm. of this dilution is inoculated on a blood agar slope and a 5 mm. loopful on "standard agar" [presumably the usual agar of the Bombay laboratory, made from an acid digest of mutton], only discrete colonies appear on the blood agar and no growth at all on the standard agar. This is in marked contrast to the pseudotuberculosis organism, where the growths in both cases are abundant or confluent. "This test brings out the fact that *B. pestis* requires blood or serum . . . . for its optimum surface growth while *B. pseudotuberculosis* does not." Antiplague serum and its concentration is another of the subjects of plague study. In an appendix to the report the standard tables approved for use in India of the statistics of antirabic inoculation are set out.

W. F. Harvey.

FEDERATED MALAY STATES. **Annual Report of the Institute for Medical Research for the Year 1931** [KINGSBURY (A. Neave), Director].—126 pp. 1932. Kuala Lumpur: F.M.S. Govt. Printing Office.

This is an interesting record of investigations which have been pursued with success in many fields of research, notwithstanding the heavy calls made upon the staff by a great mass of routine work. Here one can only summarize some of the more important sections.

Tropical Typhus.—This disease is becoming more common and more deadly; 220 cases were diagnosed during the year, and whereas death was a rare occurrence nine years ago when the disease first appeared in the country, the case mortality in 1931 was about 12 per cent. It is spreading gradually from its endemic foci; it has appeared on an oil-palm plantation where it had not occurred before, and it is becoming more frequent on rubber estates. In the days of prosperity, the rubber estates were clean-weeded, but this practice has been largely abandoned, and the increase of tropical typhus is attributed

to the cover-crops and secondary growth which spread over the surface of the soil and offer good protection to the rodent hosts of the virus. On one estate, the disease appeared at a time when it was invaded by a swarm of squirrels, and it is suggested that these rodents may serve—like rats—as carriers of the virus.

An important event recorded in the Report was the isolation of a *Proteus* strain, apparently identical with XK, from the pus of an empyema. It was agglutinated by the serum of patients suffering from tropical typhus, and by the empyema patient's own serum; the patient himself gave a positive Weil-Felix reaction at 1 in 280, XK.

Another important advance was the establishment of passage strains of the virus in guineapigs. Former attempts had failed because only 11 per cent. of normal guineapigs react to inoculation but, by feeding them on a vitamin-deficient diet, Dr. LEWTHWAITE has increased the proportion of susceptible animals to 70 per cent. (reacting with scrotal swelling and fever). He has established three strains, one of which is in the twelfth generation. He has also found that the intra-ocular inoculation of rabbits, with either guineapig virus or infective human blood, is followed by a reaction similar to that obtained by NAGAYO in typhus exanthematicus and the tsutsugamushi disease; namely, iritis with clouding of the aqueous and numerous Rickettsia-like organisms in the endothelial cells of Descemet's membrane.

Dr. P. H. MARTIN has made parallel tests of alcoholized suspensions and living cultures of *Proteus* XK in the Weil-Felix reaction. He has found that though the former are satisfactory in most cases, some cases escape detection unless living cultures are employed. The XK strain did not produce indole in 1926, but, on re-examination in 1931, Ehrlich's test gave a magenta colour. As this could not be extracted with chloroform, it was probably not due to indole.

Malaria.—Dr. Richard GREEN has found that most of the commoner Malayan anopheles can be infected in the laboratory, though the majority are apparently harmless under natural conditions. It seems that the reason why most of them are of little epidemiological importance is because they prefer the blood of other animals to that of man. *A. maculatus* is the important carrier, and human blood is found in about 85 per cent. of engorged captured specimens. An outbreak of malaria in a low-lying part of Kuala Lumpur was due to *A. hyrcanus*; 17 out of 300 specimens were found to be infected, 7 of them in the salivary glands.

Clinical or field tests have been made of plasmoquine, atebrin, quinine-stovarsol, malarcan, and other drugs. It was found that quinine-stovarsol was not superior to quinine in preventing relapses, and that it was without action on crescents; it was therefore concluded that there was little place for it in tropical medicine, particularly as it cost five times as much as quinine. Separate reports have been made on the other drugs investigated, and these reports have been summarized in this *Bulletin*.

Melioidosis.—Dr. P. H. MARTIN found, during the course of routine examinations of cerebrospinal fluids, only three specimens with marked eosinophilia, and from each of these *Pf. whitmori* was cultivated. This is the first record of the isolation of the organism from the central nervous system. An organism resembling *Pf. whitmori* was cultivated from the lungs of a domestic pig in 1930; further investigation showed that it was a true strain of that organism. Pigs are resistant to

melioidosis, and their natural infection had not been recorded previously. Three strains of *Pf. whitmori* from Java were found to be indistinguishable from strains isolated in the Malay States.

Chemical Division.—The routine work of this division, under Mr. R. W. Blair, included more than 3,000 examinations of water, milk and sewage effluents. Among the toxicological investigations there were many cases of poisoning with datura, a drug which is frequently used by thieves to stupefy their victims. There was one case of poisoning with bamboo hairs, and two fatal cases of poisoning by decoctions made from roots supplied by Chinese medicine men. Lead-poisoning in Chinese girls, resulting from the use of certain cosmetics, was reported from Singapore in 1930; consequently, 54 samples of face powder were examined in Kuala Lumpur, with the result that one in four was found to contain lead. An extract of rice polishings for the prophylaxis and treatment of beriberi is prepared in the chemical department, by Jansen and Donath's method. Dr. I. A. Simpson has found that samples prepared two years ago show no loss of activity.

Other investigations included the *Schick testing* of 300 Malay school boys. Eight months after the test, 40 per cent. of the positive reactors had become negative, although no cases of clinical diphtheria had occurred either in the school or in the district. The investigation of the comparative failure of antismallpox vaccination in one area was found to be due to a device adopted by the Malays whereby they neutralized the lymph immediately after insertion, with a mixture of salt and the juice of limes. *W. Fletcher.*

Coudray (F. E. C.). Dix-huit mois de pratique médicale hospitalière en France en milieu sénégalais. [**Eighteen Months of Hospital Practice with the Senegalese in France.**]—*Arch. Méd. et Pharm. Milit.* 1933. Jan. Vol. 98. No. 1. pp. 37–72.

A diffuse but interesting article on the Senegalese soldiers at Perpignan in the south of France, dealing in detail with pneumonia and respiratory diseases, parasitic infections and mental symptoms.

In pneumonia the author has had remarkable results with Normet's serum, and is a believer in the "fixation abscess." Finding on one occasion that a delirious man was vomiting round worms, the stools of all such patients were afterwards examined and delirium never failed to be associated with the presence of helminth eggs. On the other hand Senegalese who were not passing such eggs never became delirious. The author says he records this for what it is worth. In the parasitic section one man who was cured when his hookworms were found and treated had symptoms suggestive of disseminated sclerosis; another had haemorrhagic pleurisy. A Malagasy with fetid bronchitis recovered completely with emetine injections; he had quadrinucleate cysts in his stools. *A. G. B.*

Marcandier & Pirot (R.). Les rats de Toulon et leurs parasites. [**The Rats of Toulon and their Parasites.**]—*Ann. d'Hyg. Pub., Indust. et Sociale.* 1933. Jan. Vol. 11. No. 1. pp. 14–25.

These naval surgeons have studied the parasitic fauna of rats at Toulon, both afloat and ashore and also the endoparasites of the rats.

Ectoparasites of ship rats.—Of 340 trapped rats 233 or 68·5 per cent. were *M. rattus* and 107 or 31·5 per cent. *M. norvegicus.* These proportions held good for all ships under navigation: in training ships

the proportion of brown rats was increased owing to contact with the shore. It is held that conditions on board ship favour the black rat. Lice were the insects most frequently met with. *Haematopinus spinulosus* was found 155 times, almost equally on the two species. It does not bite man.

Of fleas *X. cheopis* was commonest. It was found 82 times, 35·2 per cent., on the black rat and 43 times, 40·2 per cent., on the brown, but the *cheopis* index of the brown is the higher. Seldom were more than 2 or 3 fleas found on the same host.

Ceratophyllus fasciatus occurred on the rats 16 times in 340 rats (4·5 per cent.) ; it must not be concluded that it is rare on ship rats for it must be looked for in the nests : here it was found 11 times in 44 nests, whereas *cheopis* was seen twice only. New-born rats being naked, there is not shelter for fleas on them. *Ctenopsylla musculi* was a rare parasite on rats.

The mite, *Dermanyssus muris*, is often found if ship rats are carefully brushed ; it is also present in the débris of the nests ; 22 of 44 nests contained them, up to 90 and 100 individuals. The black rat is the chief host, and the mite is most often met with in warm months. It bites man readily. It is never found on new ships or others where the rat population is small.

Ectoparasites of land rats.—Of 126 rats taken in the town all were *M. norvegicus*, and of a dozen from the naval dockyard the proportions of the two species were equal. Parasites were found on 132 rats in the following proportions :—

	Per cent.
Xenopsylla cheopis, 10 times	7·6
Ceratophyllus fasciatus, 42 times	32·0
Ctenopsylla musculi, 14 times	10·6
Ctenocephalus canis, twice.	
Hematopinus spinulosus, 60 times	45·4
Laelaps echidninus, 36 times	27·0
Dermanyssus muris, 16 times	12·0
Laelaps nuttalli, once.	

Note the rarity of *X. cheopis*. *Dermanyssus muris* was found only at certain points, such as abattoirs and rag picking establishments.

Endoparasites of Toulon rats.—These consist of *Cysticercus fasciolaris* larval form of a cat parasite ; *Protospirura muris* found also in the larvae of *X. cheopis* ; *Trypanosoma lewisi* in both rat species, chiefly the black rat, and also in *Dermanyssus muris* ; Bartonella and Grahamia ; *Spirella muris* the agent of Sodoku. *Hepaticola hepatica* was never found. For details of this section the paper must be consulted. *A. G. B.*

SANARELLI (G.). Sur la pathogénie et sur le traitement des infections dites intestinales. (Rapport introductif.) [**The Pathogenesis and Treatment of the So-called Intestinal Infections.**]—*Bull. Soc. Path. Exot.* 1933. Feb. 8 & 9. Vol. 26. No. 2. pp. 121–146.

In this communication the author gives his well-known views upon the mechanism of infection in typhoid fever, cholera, appendicitis and

intestinal anthrax, which he does not regard as intestinal infections at all.

The mechanism of cholera infection in man and animals receives the most detailed description. METCHNIKOFF in his classical experiments used suckling rabbits up to the 10th or 12th day of extra-uterine life and could infect them till then with cholera by ingestion. But what is the real explanation ? The digestive canal of these young rabbits is sterile at birth, although already within the first few hours the mouth and pharynx have become invaded by bacteria. Between the 4th and 5th day of life not a single microbe can be found in the duodenum and the small intestine, full of more or less digested milk as they are. Beyond the ileo-caecal valve, however, the contents of caecum, appendix and colon have an abundant microbial flora. These are the first organisms to multiply in the intestinal contents. Similarly with cholera vibrios. They are to be found first, after ingestion, only in the large intestine and not in the duodenum nor in the small intestine where they ought to have been, if they had traversed the stomach. The passage of the vibrios to the large intestine has therefore been an indirect, a parenteral one by way of the circulation and has been facilitated by the fact that the serum of suckling rabbits has no vibriocidal characters. Transported then by the blood stream, they localize themselves in the delicate intestinal walls and develop their toxi-infectious action particularly in the colon and caecum from which they may ascend to the small intestine. By the 10th or 12th day of extra-uterine life alexines appear in the blood, the buccal mucosa ceases to become an easy portal of entry for microbes and the intestinal walls have acquired greater resisting power. The young rabbits now no longer develop a true intestinal cholera. Cholera in the adult is produced in the way described. Vibrios enter the general circulation from the tonsillar region, verily a *porta malorum* : their penetration from the surface and entry of the circulation is brought about through the agency of phagocytic leucocytes. One can obtain cultures of vibrios in adults thus orally infected, 24 hours later, in the heart blood and even in the intestinal contents. In adults, however, vibrios may, although definitely enterotropic, produce no action. In animals the secret of successful arrival of vibrios in the intestine is the use of old cultures. Young vibrios are very sensitive to the bactericidal action of the body fluids and ferments. In old cultures there are granules present which are regarded by some as resistant forms of vibrio, the arthrospores of HUEPPE. Young vibrios cannot pass the oral mucosa, but these resistant granules are taken up by phagocytes and " can arrive, without being digested or injured, at their journey's end, that is to say in the intestinal contents." They may have arrived at this situation and by this route, yet do not usually give rise to cholera and this because the enteric juice, although no longer bactericidal to these forms, is still unfavourable to their proliferation. In these circumstances colon bacilli take the upper hand and the vibrios are completely inhibited. The position, however, may be quite other in sensitive new-born rabbits or in adults and cholera may be the result.

The mechanism of the algid stage is also dealt with in detail and is to be explained as an allergic phenomenon. Treatment too, whether with saline purgatives, serums or vaccines, receives an explanation in terms of the described pathogenesis.

W. F. Harvey.

KÄYSER (J. D.). **Valedictory Address.** 1932. Nov. 10. 20 pp. [No place of publication.]

Dr. Käyser has been lecturer on tropical skin diseases at the Leyden School of Tropical Medicine since 1916 and for the 15 preceding years was working as dermatologist at Batavia. The bulk of his address concerns mycology, yaws and leprosy.

Of the yaws-syphilis question he is on clinical grounds a convinced "unitarian." Since 1909 he has been against compulsory segregation of lepers in the Dutch Indies on the grounds of its cruelty and problematical benefit. He believes that the best method of limiting and gradually stamping out leprosy consists in amelioration of the general conditions. He has always allowed married couples to remain together: amongst 45 such there was no single case in which both husband and wife were affected. HANSEN is reported to have said that it was a very puzzling fact that husband and wife very seldom suffered together. He finds a liberal diet and open air life essential and attaches great value to the use of hot baths up to 40° C. (104°F.) as often and as long as can be endured; the absorption of pathological products is increased and the medicine can penetrate better into the diseased tissues. Carbon dioxide snow he finds useful in making small lepromas disappear and for internal treatment he uses chaulmoogra oil in the form of Ol. hydnocarpi exclusively. *A. G. B.*

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE. 1932. Dec. Vol. 26. No. 2. pp. 167–180 (Sect. of Trop. Dis. & Parasit. pp. 11–24). **Symposium on the Pathology of Buccopharyngeal and Skin Ulcers. Tropical Ulcer: the Distribution of** *Bacillus fusiformis* **and** *Spirochaeta schaudinni* **in the Lesion** [SMITH (E. C.)] pp. 167–172 (11–16). With 8 figs. **The Surgical Aspects of Certain Skin Ulcers** [KILNER (T. Pomfret)] pp. 174–177 (18–21). With 7 figs. **Blastomycetic Ulcers** [CASTELLANI (Aldo)] p. 178 (22). **The Pathology of Oriental Sore and Espundia** [THOMSON (J. G.)] pp. 179–180 (23–24).

E. C. SMITH. With the advent of the Warthin method of silver staining it was thought advisable to reinvestigate the question of the relative positions of the fusiforms and spirochaetes in tropical ulcer. The author notes that it is in the actively progressive lesion of 2–4 weeks duration that a true conception of their relative invasive powers may be obtained.

"In sections from such a lesion, stained by the Warthin method, the spirochaetes are found invading (to a considerable extent) the granulation tissue at the base of the ulcer. They tend in places to follow the course of the capillary loops of this tissue. Here and there the spirochaetes are found embedded in the delicate walls of the vessels, and they are also found free within the lumina. The malpighian layer of the epithelium, in the neighbourhood of the ulcer margin, is, as a rule, densely infiltrated by the spirochaetes. The fusiform bacilli, on the contrary, remain for the most part superficial, forming a dense 'palisade' or fence-like barrier just deep to the surface of the ulcer but covered more or less completely by a layer of necrotic material heavily infected with organisms of various kinds. This 'palisade' of fusiform bacilli stops short of the epithelial borders of the lesion. Under higher magnification, the bacilli composing the 'palisade' were found to be arranged in closely-packed perpendicular masses."

BROUGHTON-ALCOCK discoursed on the mucocutaneous group of spirochaetes found in varied lesions of the buccal and skin regions, and the question of their pathogenicity.

Pomfret KILNER showed photographic records of ulcer cases, including one of ulcerating granuloma, one of leishmanial sores and one probably leishmanial, in which removal, complete or partial, and Thiersch grafting, with light treatment in one instance, led to complete healing.

CASTELLANI discussed blastomycetic ulcers and J. G. THOMSON the pathology of oriental sore and espundia. *A. G. B.*

SMITH (E. C.). **Inoculation Experiments with** *Bacillus fusiformis* **isolated from Tropical Ulcer with Observations on the Bacillus.**—*Jl. Hygiene.* 1933. Jan. Vol. 33. No. 1. pp. 95–102. With 10 figs. on 1 double plate. [11 refs.]

In his first experiments the author had been unable to obtain subcultures of fusiform bacilli from the original growth "in so-called symbiosis with the spirochaetes commonly associated with tropical ulcer." This has now been successful by anaerobic culture of fragments in a medium of the composition, sheep serum 25 cc., agar 50 cc. By the 3rd day the *fusiformis* colonies were recognizable.

Subcultures were obtained by using dwarf test tubes with a small amount of medium instead of full sized ones and a semi-solid medium of the composition, horse serum 25, agar 10, broth 50. Experimental intracutaneous inoculations were made on 8 volunteers and although no typical lesion resembling tropical ulcer was produced they gave rise to considerable local toxic manifestation. In the case of one volunteer motile fusiform bacilli were found in the exudate 14 days after inoculation. No transformation of the fusiform bacilli into spirochaetes was demonstrable in either cultures or experimental lesions. *W. F. Harvey.*

i. ESLER (A. R.). **Ambulatory Treatment of Ulcer of the Leg by Strapping.**—*East African Med. Jl.* formerly *Kenya & East African Med. Jl.* 1932. Nov. Vol. 9. No. 8. pp. 237–239.

ii. MCLEAN (N.). **Ambulatory Treatment of Ulcer of the Leg.** [Correspondence.]—*East African Med. Jl.* formerly *Kenya & East African Med. Jl.* 1932. Dec. Vol. 9. No. 9. p. 272.

i. The procedure is as follows :—

"A square of lint covered with Lassar's paste is put over the ulcer, and adhesive strapping is wound round the leg as tightly as possible without obstructing the circulation, from below upwards, extending for two or three inches below and above the ulcer. This strapping is seldom removed now in less time than one month, and may without disadvantage be left on considerably longer. Exudate frequently oozes out from below the edge of the strapping, but this does not indicate delay or cessation of the healing process."

Brief notes are given of seven cases in one of which the ulcer measured 4 inches by 2, but it is noted that the bulk of patients do not return. The custom is to admit to hospital only those whose ulcers are foul

and whose tissue damage is extensive; others are treated as out-patients from the first. Ulcers of the foot are not so treated.

Cases of ulcer of leg treated in Kericho Hospital for 1931.

Total number of cases treated in hospital ...	57
Discharged as "cured"	26
Discharged as "improved" or "nearly healed"	31
Total hospital days	2,659
Average stay in hospital	46·1 days

In a smaller series of cases in 1932 the average stay was 16·8 days.

ii. Dr. McLean writes that the above method slightly modified has been employed at the Kyambu hospital with excellent results. It appears that the micro-organisms present in chronic ulcers have little or nothing to do with retardation of the healing process. In the chronic ulcer of the African native, resulting from some trauma, there is chronic irritation with fibrous tissue formation causing narrowing and occlusion of the blood vessels. *A. G. B.*

JAMES (Clifford). **Tropical Ulcers: a Quick and Successful Method of Treatment by Excision and Skin Graft.**—*Lancet.* 1932. Nov. 19. pp. 1095–1101. With 1 fig.

The author, who writes from the Methodist Mission Hospital, Choiseul, British Solomon Islands, says that the outstanding features of ulcers on the island are their obstinate resistance to ordinary methods of treatment and the readiness of the scar to break down. He says also that most subjects have an enlarged spleen and chronic malaria. He treated 45 cases by excision and immediate grafting, with completely successful results—healing in 13 days—in 41. The procedure is described in all its details—the preparation of the patient, antiseptic precautions, excision of the ulcer, application of seed grafts, dressing and after treatment. Advantages of this method are that dormant organisms are removed, that ulcer and scar tissue are replaced by pliable skin, and that little attention is needed after the grafts are applied. The disadvantage is that 11 days in bed are necessary Full details of all the cases are given in a table. *A. G. B.*

NORMET (L.) & HASLÉ (G.). Les ulcères phagédéniques et leur traitement par la vaccination locale spécifique. [**Phagedaenic Ulcers and their Treatment by Local Specific Vaccination.**]—*Bull. Soc. Path. Exot.* 1933. Feb. 8 & 9. Vol. 26. No. 2. pp. 366–372. With 2 figs.

These ulcers have been very variously treated and the treatment now advocated is with an antivirus obtained by cultivation of the causative spirilla. The spirilla, after growth for 24 hours in ordinary peptone bouillon, are sown in 5-litre flasks of nutrient bouillon of pH 7·6 and incubated at 37°C. for 21 days. The deposit, formed of spirilla, is shaken up and the contents of the flasks are distributed. This is the vaccine and is subjected to fractional sterilization at 80°C. The ulcer is first cleaned with sterile salt solution and then well rubbed with cotton wool soaked in vaccine. A dressing of the same vaccine is applied and renewed daily. The ulcer becomes an aseptic wound and begins to cicatrize. *W. F. Harvey.*

RONNEFELDT (F.). Das Problem Ulcus tropicum. Fragestellung und Untersuchungstechnik. [**The Tropical Ulcer Problem.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1933. Jan. Vol. 37. No. 1. pp. 10–18. With 6 figs.

This paper, from an American Mission station in Liberia, deals with ulcers of many kinds and their treatment.

It includes a description of the way in which a graphic record of progress is kept, by the use of cellophane, coloured inks and a pencil, by which means an accurate comparison of methods of treatment is possible. *A. G. B.*

BOUFFARD. La pneumonie sur les chantiers du chemin de fer "Congo-Océan." Extrait d'un rapport sur la main-d'oeuvre indigène et asiatique. [**Pneumonia among Workmen on the Congo-Ocean Railway.**]—*Ann. de Méd. et de Pharm. Colon.* 1932. July–Aug.–Sept. Vol. 30. No. 3. pp. 569–576.

The author discusses the epidemiology of pneumonia on this railway now under construction in Belgian Congo and recommends prophylactic measures of which these are the chief :—

Whenever cases succeed one another at short intervals or pneumococci are reported in the blood or in liver smears or in cerebrospinal fluid, regard the disease as a septicaemia and transmissible from man to man.

Stop the work of the labourers concerned. Reduce the occupants of bedrooms by one-third if possible.

Watch detachments at work to prevent the wearing of thick clothes when nudity would be the ideal. Avoid any cause of chill. Reinforce individual resistance by a supplementary vitamin-rich ration.

Serve out two tablets of stovarsol, two days running, to occupants of a room where a case has occurred. Use an appropriate vaccine.

A. G. B.

TROWELL (H. C.). **A Clinical Study of Pneumonia among Africans in Nairobi.**—*East African Med. Jl.* 1932. Dec. Vol. 9. No. 9 & 1933. Jan. No. 10. pp. 258–268 ; 294–304. [40 refs.]

This paper treats of the incidence and mortality of lobar pneumonia among Africans at Nairobi, its clinical peculiarities, the cause of death, its manner of resolution, and treatment by intrapleural injections.

The author refers to observations of Wazir CHAND [this *Bulletin*, Vol. 21, p. 846], of VINT [*l.c.* Vol. 27, p. 35] and of GARNHAM and DE SMIDT, who found 17 of 100 cases at Nairobi to be broncho-pneumonia. The author studied 194 consecutive cases in the Native Hospital, Nairobi, from August 1930 to July 1931 and diagnosed six cases of broncho-pneumonia in life, confirmed in 4 by post-mortem. Such an incidence is supported by the post-mortem records for four years. Here lobar pneumonia alone is considered.

Of the 188 cases (nearly all adult males) 39 were fatal, a mortality of 21 per cent., which, the author points out, is similar for the age-period to that of England. He discusses factors in the incidence and mortality finding that poor nutrition, usually accompanied by a palpable spleen, favours increased fatality as does probably anaemia in which the haemoglobin is below 75 per cent. ; the anaemia in question does not

seem to be related to malaria or ankylostomiasis. He believes that malaria predisposes to pneumonia and increases its fatality but the evidence is inconclusive. The faeces were in nearly all cases examined for ova ; comparison of a table of the results with one of all patients admitted shows a close approximation.

On the Rand and in Panama the highest mortality has been found in fresh arrivals. Here again the evidence shows that it is the newcomer who is most likely to contract lobar pneumonia and most likely to die from it.

Lobar pneumonia at Nairobi runs a similar course to that described in the text-books but has certain peculiarities : the sputum is haemorrhagic rather than rusty, there is a high incidence of jaundice and apical lesions are present in high percentage. For the jaundice it is surmised that the red cells of the exudate are broken up and throw a high strain on the pigmentary function of the liver, in which the healthy tissue is already reduced by cirrhosis [VINT, this *Bulletin*, Vol. 28, p. 842]. The apical pneumonias were 40 per cent. against 13 in adults in Europe (OSLER) ; this is a distribution such as is found in European children. Searching for an anatomical reason the author found that the African's diaphragm is relatively higher than that of the European adult, resembling in this respect that of the European child. He suggests that this restricts movement at the base of the lungs and directs infection to the more active apical lobes.

It was noted that crisis was the rule in monolobar infection, and lysis in polylobar.

Six pages are devoted to a discussion of intra-pleural injections, the technique and results. It is concluded that intra-pleural injections of a dilute novocaine solution in normal saline as a rule considerably relieve severe pleural pain. *A.G.B.*

RAO (M. V. Radhakrishna). **An Investigation into the Causation of Ascites.**—*Indian Jl. Med. Res.* 1932. Oct. Vol. 20. No. 2. pp. 459–488. [53 refs.]

The record of an investigation of the cause of ascites in 69 patients admitted to hospital at Vizagapatam, Madras, between July 1931 and February 1932.

In a small group of cases of ascites the causation remains obscure even after thorough investigation. MEGAW in 1921 pointed to chronic dysenteric peritonitis as a probable cause [this *Bulletin*, Vol. 21, p. 688] ; he suggested that dysentery toxins pass from the bowel to the peritoneal cavity.

Of the author's 69 cases, which are tabulated, 16 were attributed to decompensation of the heart, 10 to kidney inefficiency, 2 and 4 to malignant tumours and tubercle, 21 to portal cirrhosis and 8 to syphilitic cirrhosis, 1 only to chronic peritonitis. Of the cirrhosis cases, in 17 a diagnosis was only reached after complete investigation. The author describes the tests he made and gives a number of tables. Seven of these show the results of agglutination tests with dysentery organisms. No evidence was found that agglutinins occur in a higher proportion in ascites than in non-ascites cases. The author reaches the following conclusions :—

" (1) The results of the investigation into the cause of ascites in this part of the Madras Presidency definitely show that cirrhosis of the liver

and decompensation of the heart are the commonest causes of ascites, and do not support the view of Megaw, that 'the commonest form of ascites in India is not due to cirrhosis of the liver but to a fibrosis of the peritoneum resulting from irritation of the peritoneum by the toxins of the bacilli of dysentery.'

"(2) Kala-azar is not seen here and does not play any rôle in the aetiology of ascites.

"(3) Bacillary dysentery is very common and the Flexner group of organisms appear to be the common invaders.

"(4) The rôle of bacillary dysentery in the causation of ascites is discussed. It is shown that 'chronic dysenteric peritonitis' (Megaw) is rare and should not be considered as a 'common' cause of ascites; hepatic cirrhosis is the probable cause even in cases of ascites with previous history of dysentery.

"(5) While positive agglutination tests against the bacilli of Shiga and Flexner point to a previous infection with bacillary dysentery, they fail to prove the aetiologic relationship between dysentery and ascites. A history of dysentery shortly before the onset of ascites is of no particular significance and it should not be taken as a point in favour of 'chronic dysenteric peritonitis' leading to ascites.

"(5) The causes of chronic peritonitis are many and it is not always easy to prove whether the thickening of the peritoneum is the cause or the result of ascites. Even if evidences of bacillary dysentery, recent or old, are present in the intestines, the thickening of the peritoneum cannot be attributed to the dysentery, unless all the other causes for the change in the peritoneum are excluded." *A. G. B.*

CONNOR (Frank). **Splenectomy. Indications and Results with Special Reference to Conditions obtaining in the Tropics.**—*Indian Med. Gaz.* 1933. Jan. Vol. 68. No. 1. pp. 35–39.

The author points out that there is in India an enormous amount of material awaiting investigation but the necessary co-operation between physician, surgeon and pathologist is lacking. For the surgeon two essential factors are earlier and more accurate diagnosis and a better procedure for dealing with fibrosed spleens with extensive adhesions. After a reference to ruptured spleens, wandering spleens, abscesses, cysts and new growths he combines three tables, dealing in all with 1,275 splenomegalies, from Bengal, Bombay and Rangoon. [These, as the author admits, are not strictly comparable.] The first series was collected by DE, on whose paper the author draws [*ante*, p. 43]. Here there was a series of 54 cases of greatly enlarged spleens none of which were accepted as chronic malaria, but Connor thinks that a certain number must have been of malarial aetiology. He compares this group with a similar one described by HUGHES and SHRIVASTAVA [*l.c.* Vol. 29, p. 348].

In regard to kala azar SHANKS and DE showed that in 23 of 25 cases of parasite-positive enlarged spleens no increase of fibrous tissue was demonstrable; here the question of splenectomy does not arise. After discussing shortly the other series (Bombay and Rangoon) the author says "we are driven to the conclusion that if we are to be guided by these groups of post-mortem findings many of the largest examples of splenomegaly cannot be regarded as post-malarial or post-kala azar conditions." Many progress to a fatal issue and could perhaps be saved by the surgeon. Splenectomy is rare in India owing to the high mortality, which again is due to the low resistance of the patients. It is suggested that ligature of the splenic artery is worthy of trial. *A. G. B.*

PETZETAKIS (M.). A propos de la nature de l'épidémie de Syra. [**The Nature of the Syra Epidemic.**]—*Bull. Soc. Path. Exot.* 1932. Dec. 14. Vol. 25. No. 10. pp. 1058–1061. [15 refs.]

A febrile epidemic on the Island of Syra, one of the Cyclades, in 1931, at first believed to be dengue, has much exercised the minds of the Greek doctors; its bibliography extends to 15 papers. There seems now to be no question that it was leptospiral and the author says that at Athens this is now accepted by all [see this *Bulletin*, Vol. 29, p. 566].

A. G. B.

FITZGERALD (G. H.). **An Outbreak of Exfoliative Glossitis in an Assam Jail.**—*Indian Med. Gaz.* 1932. Oct. Vol. 67. No. 10. pp. 556–559.

An outbreak of irritative glossitis occurred among 400 prisoners in Gauhati Jail, Assam, in 1931-32. About one-third were attacked. Seventy per cent. recovered on a diet from which condiments had been removed and the addition of 1 oz. of yeast daily to the diet raised the recovery rate to over ninety per cent. Antecedent dysentery seemed to play a part in the aetiology. The administration of two drachms of cod liver oil daily for 3 weeks was without effect. The author seems to suspect that the condition has some relation to pellagra. *A. G. B.*

COLLARI (Salvatore). Rapporti tra malaria e tubercolosi dal punto di vista epidemiologico, clinico e biologico. (**Relations between Malaria and Tuberculosis.**)—*Riv. di Malariologia.* 1932. May–June. Vol. 11. No. 3. pp. 308–335. [37 refs.] English summary pp. 413–414. [Summary appears also in *Bulletin of Hygiene.*]

The possible interrelation and interaction between malarial infection and tuberculosis are considered from the epidemiological, the clinical, and the biological aspects. The author's findings are of considerable interest, though naturally in so important a question further evidence, confirmatory or otherwise, will be looked for.

His investigations have convinced him that in the districts he studied (Sardinia) mortality from malaria is progressively diminishing while that from tuberculosis undergoes little change, but where the death rate from malaria is high that from tuberculosis is low [this, of course, is far from showing aetiological interaction]; malaria mortality is high in infants, low in young adults, the opposite of what obtains in tuberculosis. Clinically, when chronic malaria patients contract tuberculosis, the progress of the latter disease is slow and of the fibroid type, but if a tuberculous subject acquires malaria, there is a tendency to rapid spread of a miliary character. Biologically, he maintains that in a "malarious soil" [tissue] the *Myco. tuberculosis* develops poorly and its virulence is attenuated, possibly because the fibrosis resulting from the malaria presents a resisting barrier to the spread of the tuberculosis process. The antagonism, if any, between the two infections has nothing to do with the processes of immunity.

H. H S.

JETTMAR (H. M.). Beiträge zur Epidemiologie der Malaria und Pest im Fernen Osten. [**Epidemiology of Malaria and Plague in the Far East.**]—*Zent. f. Bakt.* I. Abt. Orig. 1932. Vol. 127. No. 1/3. Beiheft pp. 178*–184*.

The author, who was employed in the Epidemiological Section of the Nanking Health Office in 1931, studied the epidemics of malaria and plague which at that time ravaged large areas of China. He here gives his personal experiences, and some history, of these diseases.

Malaria.—Malaria was so severe in some districts that it was reported as plague. It was especially bad in the provinces Kiangsi and Honan where two armies confronted one another ; 90 per cent. of cases were subtertian, the rest tertian ; the mortality was about 10 per cent. The rarity of blackwater fever is noted. The species of Anopheles, *A. hyrcanus* var. *sinensis*, is found in hilly country up to nearly 5,000 feet. The neighbourhood of Nanking also is malaria-ridden. Of 370 persons examined by the author 293 were infected, 240 with subtertian, 47 with tertian and 3 with quartan. In Manchuria two large malarial areas, both in the north, are described. The difficulties of combating malaria in China are stressed.

Plague.—There are three active endemic areas in the Far East ; one extending from Transbaikalia into north Manchuria, the second in Inner Mongolia and south Manchuria (Liao Ho basin) and the third to the west of Peking in Shansi, Shensi and Ordos. Part of the second area has changed from a sparsely to a densely populated country, and hordes of rats have accompanied the settlers. The author examined a village here and found that two-thirds of the fleas collected in houses were *X. cheopis* and one-third *Pulex irritans*, and of the *X. cheopis* examined more than three-fourths were plague-infected [actual figures not given]. Most of the inmates of these huts sickened of plague soon after. Another area examined by the author was in the north-west of Shansi. Here the natives dwell in hollows in the steep hillsides, which are infested with rats.

In the discussion the author stated that according to GOLOFF and JOFF plague infected tarabagan fleas (*Oropsylla silantievi*) at a temperature of 0–15° may live and retain infectivity for 358 days. [The longest period mentioned in this *Bulletin* is 206 days (Vol. 24, p. 937). These were suslik fleas.]* *A. G. B.*

NICOLLE (Charles). Deux problèmes nouveaux de diagnostic différentiel, celui des fièvres exanthématiques et celui des fièvres récurrentes. [**Two New Problems of Differential Diagnosis—Exanthematic and Relapsing Fevers.**]—*Bull. Inst. Pasteur.* 1932. Oct. 31. Vol. 30. No. 20. pp. 961–970.

Exanthematic fevers.—This is a natural group the type of which is old-world typhus. The blood in these fevers has agglutinating properties for certain bacteria of the Proteus group, and as pathogenic agents the Rickettsiae. In all forms the carrier is an invertebrate. Exanthematic fevers foreign to Europe and N. Africa are not here considered ; the discussion concerns old-world typhus, benign typhus

* In Comptes Rendus du Premier Congrès Antipesteux de l'U.R.S.S. (Saratov, 1928) (noticed in this *Bulletin*, Vol. 26, p. 93), a table is given (p. 115) headed "Maximum de conservation du B. pesteux dans les puces," in which this figure occurs for *O. silantievi*, 275 days for *Ceratophyllus vesquorum* and 210 for *C. consimilis* at 0° to 15°. These species all bite man. The survival at 14° to 27° was usually about half these periods.

and eruptive fever (*fièvre boutonneuse*). A doctor on the Mediterranean coast may meet with all three ; how is he to distinguish them ?

Clinically, well-marked old-world typhus is readily distinguished from benign typhus by its severity, but it is often well borne by natives of regions where it has raged for centuries, and is always mild in the child. On the other hand so-called benign typhus may have a considerable fatality as is often seen in Mexico. In this variety there is a tendency to haemorrhage, especially epistaxis, which is never seen in old-world typhus. The extension of the eruption, first noted by Nicolle, to the palms and soles in eruptive fever is seen also in Mexican typhus. The tache noir, considered to characterize eruptive fever, is a variable phenomenon, and may be so slight that its very presence is doubted. The clinical differences in fact between benign typhus and eruptive fever may be so slight that diagnosis is impossible.

Only laboratory methods can separate these three diseases ; for they show the specificity of the three viruses. The essential fact is that the viruses of the two typhuses (brain of infected animal) vaccinate against one another but not against eruptive fever, and that of eruptive fever vaccinates against itself but not against the typhus viruses ; and another capital difference is that the louse can be infected with the typhus viruses but not with eruptive fever. At first the guineapig and rat were found insusceptible to eruptive fever, but both have now been infected. A distinctive character is furnished by the Weil-Felix reaction ; the agglutinating property for Proteus X_{19} is infinitely less marked with the serum of eruptive fever than with that of either form of typhus ; when eruptive fever is in question it is well to employ X_2 as well as X_{19}. The male guineapig usually reacts differently to the two forms of typhus, but this difference is not invariable. The rat, however, is an animal subject to natural infection and the differences in its behaviour are of importance : with old-world typhus the infection is unapparent and after 12–13 passages dies out ; with the benign virus there is always febrile infection and frequently death in hypothermia ; and passages can be continued indefinitely. The author would re-name the two typhuses historic typhus and murine typhus. Both viruses are pathogenic to the louse, but whilst that of murine typhus develops with such rapidity that lice begin to die on the third day and all eventually succumb, the virus of historic typhus takes 6 days to begin to kill lice and all do not die. The adaptation of murine typhus to the louse is more recent than that of historic typhus. Neither virus, however, affects the well-being of the flea, and both can persist in the flea for more than a month. The flea has preceded the louse in the natural history of typhus.

Relapsing fevers.—There are two forms in North Africa, relapsing fever transmitted by lice and epidemic, and relapsing fever transmitted by Ornithodorus ticks, with little tendency to extension. However a tick-transmitted spirochaete can be equally well transmitted by an Ornithodorus from another part of the world. How are N. African doctors to distinguish these two forms ? Clinically tick-transmitted relapsing fever is very mild, febrile attacks are less definite, shorter and more numerous than in the other form ; the duration is often prolonged. The arsenobenzols are much less active in the tick transmitted fever and the frequency of eye symptoms is greater. On microscopic examination spirochaetes are numerous in the louse form, whereas in the tick form they may be so rare that they cannot be demonstrated.

Again it is in the laboratory that the diagnosis is clinched. The diagnostic animal is the guineapig. Insusceptible or almost so to the louse virus, when inoculated with the tick virus it contracts a relapsing fever, characterized by febrile bouts in which spirochaetes are numerous in the blood. To diagnose the one from the other form of relapsing fever in N. Africa all that is necessary is to inoculate a guineapig, and the author anticipates that when this becomes the practice relapsing fever attributed in Algeria, Lybia and Egypt to lice will often be found to be really the tick form. *A. G. B.*

SPINELLI (Antonio) & REITANO (Ugo). Richerche sulle blatte, quali agenti di diffusione dei germi del colera, della febbre tifoide e della dissenteria bacillare. [**The Cockroach as Transmitter of Cholera, Typhoid and Bacillary Dysentery.**]—*Ann. d'Igiene.* 1932. Nov. Vol. 42. No. 11. pp. 745–755. [11 refs.]

The cockroach has been incriminated as an agent of transmission of disease. Although this insect may be left out of account in modern houses this is not the case with old houses in Rome where it is a pest and very difficult to eradicate. The author's results from feeding organisms to cockroaches may be summed up in the statements that :—(1) The germs of cholera, typhoid fever and bacillary dysentery are capable of surviving in the gastro-intestinal tract for 15, 9 and 6 days respectively. (2) These germs are to be found in the dejecta 86, 72 and 96 hours respectively after the ingestion of the infected food. (3) There is no loss of virulence of the germs in their passage through the cockroach. *W. F. Harvey.*

ROGERS (Leonard). **Result of the Forecast of Cholera, Smallpox and Plague in India in 1932 and Forecast for 1933.**—*Indian Med. Gaz.* 1933. Jan. Vol. 68. No. 1. pp. 1–3.

In this article there is set forth the outcome of the forecast for cholera, smallpox and plague during 1932 together with the new forecast for 1933. The analysis of the 1932 results shows that the forecast was "the most accurate of the three yet issued, in spite of the well distributed rains of 1931 having made a forecast difficult." Each province is dealt with in detail and the correspondence of calculated with observed data is manifest. The probable issues for 1933 were elaborated in London on 18th November 1932 from the climatic data available up to October. Monsoon rains were well distributed in 1932 with some defect in Bihar, Madras and the United Provinces and an excess in the N.W. Frontier Province and Sind. "These conditions are unfavourable to widespread epidemics of cholera or smallpox in India as a whole, but the comparatively low hot-season temperatures and saturation deficiencies in the Deccan and Eastern Central Provinces favour increased plague there." *W. F. Harvey.*

ISHAK (William). **Bismuth in Furunculosis.**—*Jl. Egyptian Med. Assoc.* 1933. Jan. Vol. 16. No. 1. pp. 97–100.

The author finds bismuth injections curative for boils in Egypt.

During the summer many cases of furunculosis are seen at Kasr-el-Aini Hospital, Cairo. They are frequently resistant to all kinds of treatment, yeast, vaccine, manganese, etc., and linger on till the cool weather comes. The author has tried intramuscular injections of bismuth in 100 cases.

"The bismuth we used was a suspension of finely divided metal in isotonic glucose containing 0·20 gm. of bismuth in 1 cc. of the suspension. The injections were given twice weekly. The dose advised is 0·30 for the adult male, 0·25 for the female, for children of 1–3 years 0·05 and for those above that 0·10 up to the 10th years and 0·02 for each year more."

Many patients did not come back after the first or second injection but of the 52 who were followed to the end only 5 were failures, a cure percentage of 90 per cent.; there were 20 cures after two injections; a few had 5.

After the 1st or 2nd injection the boils were reduced to half or one-third of their previous size; even when pus had begun to form it usually dried up. *A. G. B.*

PERRONE (Luigi). Di un' adatta cura della tossicosi da morso di *Vipera aspis.* [**Appropriate Treatment of Poisoning by an Asp.**]—*Arch. Ital. Sci. Med. Colon.* 1933. Feb. 1. Vol. 14. No. 2. pp. 138–140. English summary (5 lines).

Asp bites are not uncommon in Italy among peasants engaged in mowing, reaping, or other field work. As a rule they are treated by ligature, sucking out the poison, and applying locally calcium hypochlorite, or chloride of gold, or chromic acid, and injecting 10 cc. of 1 per cent. permanganate of potassium; polyvalent serum is used if available.

The case recorded here is that of a youth of 16 years, bitten on the right arm while mowing; a ligature was applied, attempts made to suck and press out the poison and direct cautery (flame) was carried out. Some ten hours later he showed signs of general poisoning, vomiting, tachycardia, drowsiness and oppression. The wound was painful, oedematous, surrounded by bullae with serum; temperature 40·1°C., respirations 31, pulse 135.

The author injected the contents of a phial (5 cc.) of *Septacrolo Ciba* in the deltoid region. Two hours later the temperature was 38·6°C., respiration about normal, pulse 105. Next day the temperature being 38°C. and the condition of the limb as before, another 5 cc. were injected into the deltoid. The same evening the patient sweated, temperature became normal, the local condition was greatly improved and his mind was clear, and after 3 days recovery was complete.

Septacrolo, prepared by an Italian firm Ciba, is a combination of a silver salt with an acridine derivative—nitrate of dimethyl-diaminomethyl acridine—and contains about 22·3 per cent. silver. It is a reddish brown powder soluble in distilled water. It is said to be a powerful bactericide and its injection is followed by marked leucocytosis. It is put up in phials of 1 and 5 cc. for intravenous or intramuscular injection. The author is of opinion that since the symptoms of general toxaemia appeared at so long an interval after the bite the patient would have had small chance of recovery under ordinary conditions and that the effects of the Septacrolo were very striking.

H. H. S.

FANJUL (Luis). Ensayos de vacunación percutánea con bacilo tífico, disentérico y vibrión colérico. [**Percutaneous Vaccination with** *Bact. typhosum*, *Bact. dysenteriae*, **and** *Vibrio cholerae*.]—*Trabajos.* Madrid. 1933. Jan. 15. Vol. 2. No. 7. pp. 26–27.

In 1931 LÖWENSTEIN demonstrated the development of agglutinins to *Bact. typhosum* in dogs on whose shaved skin killed bacilli had been rubbed. The author, under the direction of Professor LÖWENSTEIN, continued these investigations, using a glycerinated suspension of *Bact. typhosum*, killed by formol, containing 15 "billions" [probably thousand millions] per cc., applied to rabbits and guineapigs. The method of procedure is described :—

Both sides, ventrally and dorsally, the skin was shaved, then lightly scarified with sand-paper, cleansed with ether or benzine. The bacillary emulsion was then applied, drop by drop till some 3 cc. had been used [the dose, 45,000 million, seems very large], absorption being assisted by manual friction ; this was repeated twice at intervals of 7 or 8 days.

A fortnight to three weeks after the third vaccination blood was withdrawn from the heart and the serum tested for agglutinins. Four rabbits' sera agglutinated in dilutions varying from 1 : 1,000 to 1 : 3,000 and four guineapigs in a titre up to 1 : 200.

The organisms of dysentery and cholera similarly applied gave rise to no agglutinin formation. *H. H. S.*

COIA (A. G.). **Some Notes on Nephritis in British Guiana.**—*Brit. Guiana Med. Ann. for 1932.* pp. 45–50.

The author while in charge of the Male Chronic Medical Ward (? at Georgetown) examined 56 cases admitted with the diagnosis, nephritis or albuminuria with oedema ; only 30 turned out to be nephritis when subjected to full clinical and laboratory investigation. Six are described as dropsy of doubtful origin and the question is discussed whether these are cases of beriberi ; if they are, it is difficult to explain why this condition should be practically confined to East Indians. [Epidemic dropsy in Fiji and elsewhere has been attributed to mustard oil, which is in general use by Indians (see this *Bulletin*, Vol. 28, p. 437).] One of the conclusions reached is that nephritis in British Guiana does not differ from that described in other parts of the world, nor is it more prevalent. [The author appears not to have met with the malarial nephritis reported by GIGLIOLI from up-country.] *A. G. B.*

FAIRLEY (N. Hamilton). **Obstructive and Haemolytic Jaundice in the Tropics.**—*Proc. Roy. Soc. Med.* 1933. Mar. Vol. 26. No. 5. pp. 578–583 (Sect. of Trop. Dis. & Parasit. pp. 26–31). [21 refs.]

Dr. Fairley in this paper treats of a subject, perhaps one ought to say, a symptom of great importance in the tropics ; equally so, of course, in temperate climates though the possible causes are fewer. He points out that jaundice of haemolytic origin, of toxic or infective aetiology, is of greater significance to the tropical practitioner than is the obstructive form. It is shown that in many cases where obstruction would be inferred as considerable—parasites infesting the liver, hepatic abscess, etc.—jaundice is by no means a frequent symptom, unless, of course, the parasite, *e.g.*, Ascaris, invades and blocks the bile ducts. The haemolytic form has several varieties, aetiologically : physiological, as in icterus neonatorum ; congenital as in sickle-cell anaemia

and in Minkowski's disease ; parasitic as in malaria, and Oroya fever ; in septicaemia ; in some snake poisonings and in megalocytic anaemia.

In order to elucidate the aetiological factor or factors there is need for " careful clinical, pathological and bio-chemical investigation of cases of jaundice met with in tropical practice," which calls for facilities unfortunately rarely available to tropical practitioners and for a standard of academic knowledge only attained by the specialist, though it is but too true, as Dr. Fairley states, that only " along such lines can the present deficiencies in our knowledge be rectified." *H. H. S.*

HECKENROTH (F.) & RAYNAL (J.). Un cas de susceptibilité pour la quinine, difficulté de la désensibilisation. [**Case of Quinine Susceptibility—Difficulty of Desensitization.**]—*Marseille-Méd.* 1932. Dec. 25. Vol. 69. No. 36. pp. 819–830. [14 refs.]

A man of 22 was invalided from Syria for malaria and quinine intolerance in 1931. He was seen in the seventh attack with *P. vivax* in the blood and a pruriginous eruption on the skin following the taking of extract of cinchona the night before. He stated that on landing in Syria for military service he was submitted to prophylactic quininization (25 cgm. of the hydrochloride) and that fever and a red eruption, at first regarded as food poisoning, followed the first dose.

The authors cured the malaria with stovarsol and then attempted to rid the patient of his quinine intolerance. He received increasing doses of quinine at first subcutaneously, then by the mouth, starting with 5 mgm., but the cure had to be interrupted three times, and five months was required for its completion. He now tolerates 1·25 gm. a day without symptoms other than slight peeling of the hands. Peptone was given as recommended by MOLLOW [this *Bulletin*, Vol. 22, p. 993] without apparent benefit. The skin symptoms were severe and special attention is drawn to the changes in the nails, which the authors believe have not been recorded. They are described as yellowish, dry and friable with longitudinal striae and numerous cup-like depressions. *A. G. B.*

MOREIRA (Duarte). Sobre um caso de nevrite toxica do acustico pelo oleo de chenopodio. [**Auditory Neuritis due to Oil of Chenopodium.**] —*Folha Med.* 1932. Sept. 5. Vol. 13. No. 25. p. 291.

The patient was a man of 20 years working in a pharmaceutical laboratory [and, therefore, ought to have known better] who, thinking that he might be harbouring worms, took 20 cc. of oil of chenopodium in a single dose. Shortly afterwards he became pallid, complained of hazy vision and general pains. He was taken home where he vomited and passed into a deep sleep for 11–12 hours. On awaking he was completely deaf, but had marked tinnitus in both ears. Three days later hearing began to come back, but for two years there has remained a persistent buzzing in the right ear.

Examination revealed no defect of the tympanum ; there was no vertigo or nystagmus but signs of affection of the VIIIth cranial nerve. The personal history was good, W.R. negative and no cause could be discovered other than the fact of the sudden onset following immediately on taking a large dose of the drug. *H. H. S.*

FRÓES (Heitor P.). Sur un poisson toxiphore brésilien : le " niquim " (*Thalassophryna maculosa*). [**A Poisonous Fish of Brazil : the Niquim** (*T. maculosa*).]—*Rev. Sud-Américaine de Méd. et de Chirurg.* Paris. 1932. Nov. Vol. 3. No. 11. pp. 873–878. With 3 figs.

A clinical lecture. Some account of the fish's habits. No details of the venom or its effects. *A. G. B.*

ASHFORD (Bailey K.). The Contribution of Hematology to the Diagnosis of Disease-Conditions in the American Tropics.—*Bol. Asoc. Med. de Puerto Rico.* 1933. Jan. Vol. 25. No. 1. pp. 14–17.

BHATTACHARYYA (Rasamay). Intensive Iron Treatment of Anaemia in a Tea-Garden Labour Force.—*Indian Med. Gaz.* 1933. Mar. Vol. 68. No. 3. pp.134–135.

COCHRANE (E.). Rheumatic Fever in the Tropics.—*Brit. Guiana Med. Ann. for* 1932. pp. 92–97.

FINKELSTEIN (M. H.). Recent Discoveries in Virus Diseases of Tropical Climates. *Jl. Trop. Med. & Hyg.* 1933. Mar. 15. Vol. 36. No. 6. pp. 81–83. [12 refs.]

GRANTHAM-HILL (C.). Anaesthesia in Tropical Surgery.—*Lancet.* 1933. Feb. 11. pp. 295–297.

ITO (Yoshio). Zur Kenntnis des Paederusgiftes.—*Fukuoka-Ikwadaigaku-Zasshi* (*Fukuoka Acta Med.*). 1933. Feb. Vol. 26. No. 2. [In Japanese. German summary pp. 20–21.]

KAUFMANN (E.). Zur Verringerung von Chininnebenerscheinungen besonders bei intramuskulärer, intravenöser und endolumbaler Anwendung.—*Klin. Woch.* 1933. Mar. 4. Vol. 12. No. 9. pp. 366–367. [40 refs.]

NÁJERA (Luis). Los arsenobenzoles en la terapeutica de las enfermedades exoticas.—*Medicina Países Cálidos.* Madrid. 1933. Mar. Vol. 6. No. 2. pp. 81–103. With 13 figs.

PALTHE (P. M. van Wulfften). Amok.—*Nederl. Tijdschr. v. Geneesk.* 1933. Mar. 4. Vol. 77. No. 9. pp. 983–991. With 1 fig.

PERVÈS (J.). Syndrômes péritonéaux chez les noirs (appendicites et fausses appendicites).—*Arch. Méd. et Pharm. Nav.* 1932. Oct.–Nov.–Dec. Vol. 122. No. 4. pp. 465–477.

THEMELIN (R.). Traitement des dermatoses du type " ulcère tropical."—*Bull. Méd. du Katanga.* 1932. Vol. 9. No. 6. pp. 167–173.

WALKER (J. W.). Pregnancy in the Tropics. Should the European Woman Come Home?—*Jl. Trop. Med. & Hyg.* 1933. Feb. 1. Vol. 36. No. 3. pp. 41–42.

REVIEWS AND NOTICES

HENNING (M. W.) [Professor of Veterinary Science in the Faculty of Agriculture, University of Pretoria]. **Animal Diseases in South Africa. Vol. I. Bacterial and Protozoal Diseases.**—pp. xi + 1–405. With 43 illustrations. **Vol. II. Virus and Deficiency Diseases, Plant Poisons.**—pp. x + 406–878. With 84 illustrations. 1932. South Africa: Central News Agency, Limited. [£2. 10s. per set of 2 Vols. from Gordon and Gotch, Ltd., 75–79, Farringdon Street, London, E.C.4.] [Review appears also in *Bulletin of Hygiene.*]

In no country in the world, during the past thirty years, has veterinary science progressed more rapidly and conferred greater benefits on stock-farming than in South Africa. A great mass of knowledge concerning animal disease in the sub-continent has accumulated, but much of it has been rather widely scattered in official reports and journals that in many instances are inaccessible to the majority of students, and to veterinarians working far from a few centres in South Africa itself. For example, the reports of some of the administrative and field veterinary officers, and especially those of the late D. HUTCHEON, contain a large amount of valuable information derived from years of careful observation. The results of the investigations of Sir Arnold THEILER and his staff, carried out at Onderstepoort and in the field, are more readily accessible, but the published work has attained dimensions that render summarization really essential for new workers in the same or similar fields.

Prof. Henning, of the University of Pretoria, has set himself the task of collecting the main facts concerning the animal diseases of South Africa, and of presenting them in a form suitable for the veterinarian and the veterinary student of that country. He has earned the gratitude, not only of those for whom his book is particularly intended, but also of all who are interested in the diseases of animals in tropical and sub-tropical countries.

The work covers a wide field. The first volume is divided into two parts, in the first of which he describes the more important bacterial diseases of the domestic animals. Part II deals with diseases associated with protozoan parasites. The second volume consists of three parts, dealing with virus diseases, plant poisoning and deficiency diseases respectively. The author has been guided in his selection of subjects by the relative importance of a disease to South Africa, and his choice appears to be judicious.

Among the bacterial and virus diseases here dealt with, there are several which are of at least equal importance in Europe (anthrax, tuberculosis, contagious abortion, foot-and-mouth disease and swine fever), but Prof. Henning has included the historical facts and the facts concerning their distribution in South Africa, and any special features seen under South African conditions. The section on poisonous plants is particularly valuable, and its length, which in relation to the other parts is very considerable, reflects the importance of poisonous plants to the South African stock-owner, and the very considerable attention paid to the subject by South African investigators.

The author has covered a very wide field, and in parts he has had to compress a great deal of information into small compass. It is not, therefore, surprising to find that some facts are stated in a rather ambiguous form, and that there are a few definite errors.

The work forms a valuable summary of the main facts concerning animal disease in South Africa, however, and it contains a great deal

of information that has hitherto been practically inaccessible to the majority of veterinarians. The book will be appreciated by those for whom it is particularly intended, and we can recommend it to any reader who is interested in tropical veterinary science. The volumes are well turned out, and contain some excellent illustrations. *W. H. Andrews.*

FELDMAN (W. M.) [M.D., B.S., M.R.C.P.Lond., F.R.S.Ed., Senior Physician, St. Mary's Hospital for Women and Children, etc.]. **General Haematology. With Special Reference to the Child in Health and Disease.**—96 pp. With 7 figs. Pocket-Monographs on Practical Medicine. 1933. London: John Bale, Sons & Danielsson, Ltd., 83–91 Great Titchfield Street, W.1. [2s. 6d.]

This little book deals in turn with the chemistry of the serum, the corpuscles, maintenance of corpuscular equilibrium, the platelets, blood diseases, blood in treatment, bacteriology and parasitology of the blood and blood in its biological and sociological aspects. The chapter on bacteriology and parasitology is a short one and the reference to the tropics is so brief that it is quoted here *in extenso* :—" The parasitology of the blood is of very little practical importance in this country. In tropical climates, the parasites often found in the blood are the *Plasmodium malariae* (within the red corpuscles) ; filaria, mostly found in evening specimens of blood ; the spirillum of relapsing fever ; and the various trypanosomes." If a second edition is called for, this paragraph should be re-written, or deleted.

A. G. B.

MEIJERS (Frederik Maurits). **Onderzoekingen over urobilinurie als lever-functie-proef.** [Urobilinuria as Test of Liver Function.] [Thesis for Doctorate in Medicine at Amsterdam University.] —pp. ix + 132. With 12 figs. [2 pages of refs.] English summary pp. 119–123. 1933. Amsterdam : Scheltema & Holkema's Boekhandel N.V.

This work deals with a question of physiological and pathological biochemistry—urobilinuria and its quantitative presence as a test of liver function. The experiments were carried out on Javanese men under tropical conditions but apart from this fact the subject is not one with special tropical application and consequently does not call for detailed review in this *Bulletin.* *H. H. S.*

MODENA, REGIA UNIVERSITÀ DI : **Rapporto sul funzionamento dell' Istituto di Patologia Coloniale. Anno Scolastico 1931–1932** [FRANCHINI (G.), Director]. [Report on the Institute of Colonial Pathology, Modena, for 1931–2.]—80 pp. With 65 figs. 1933.

This is the report on the activities during 1931–32 of the Institute of Colonial Pathology of the Royal University of Modena. It is divided into 7 chapters. The first gives an account of the curriculum and a list of those who took the courses ; the second records the scientific and research activities—mainly determination of blood and faecal parasites and identification of insects—and a list of papers and articles published from the Institute during the year, thirty in number, chiefly helminthological and protozoological. Nearly one-third are by the Director, showing that Professor Franchini undertakes research work in addition to his administrative duties. Chapters III and V give a list of material maintained, parasites living and in culture, etc., and an enumeration of museum specimens—snakes, fish, worms, insects (mosquitos, flies, ticks), scorpions,

drugs and plants. Chapter IV mentions the names of Colonial Medical Officers and others, with their stations, associated with the Institute and its activities. The whole is well illustrated. *H. H. S.*

VAN NITSEN (R.) [Médecin en chef de l'Union Minière du Haut-Katanga]. **L'hygiène des travailleurs noirs dans les camps industriels du Haut-Katanga.**—[The Health of Negro Workers in the Industrial Settlements of Haut-Katanga.] 248 pp. With 9 charts, 4 figs., 1 map & 7 figs. on 4 plates. 1933. Brussells: Marcel Hayez, Imprimeur de l'Académie Royale de Belgique, 112 rue de Louvain.

This book is reviewed in *Bulletin of Hygiene*, Vol. 8, p. 579.

Printed under the authority of HIS MAJESTY'S STATIONERY OFFICE
by the South Essex Recorders, Ltd., High Road, Ilford,

(509) Wt. P1/101 1875 9/33 S.E.R. Ltd. Gp. 353.